ZooKeys 366: 1–194 (2013)
doi: 10.3897/zookeys.366.6172
www.zookeys.org

MONOGRAPH

A peer-reviewed open-access journal
ZooKeys
Launched to accelerate biodiversity research

Trogossitidae: A review of the beetle family, with a catalogue and keys

Jiří Kolibáč[1]

1 *Moravian Museum, Department of Entomology, Hviezdoslavova 29a, 627 00 Brno, Czech Republic*

Corresponding author: *Jiří Kolibáč* (jkolibac@mzm.cz)

Academic editor: *R. Gerstmeier* | Received 30 August 2013 | Accepted 20 November 2013 | Published 31 December 2013

Citation: Kolibáč J (2013) Trogossitidae: A review of the beetle family, with a catalogue and keys. ZooKeys 366: 1–194. doi: 10.3897/zookeys.366.6172

Abstract

The family Trogossitidae (Coleoptera: Cleroidea) is reviewed to species level. Keys to its genera, tribes and subfamilies are presented for the first time. All known species and subspecies are listed, together with complete taxonomic references back to 1910, the date of issue of the last catalogue of Trogossitidae. Higher taxa reviews are accompanied by remarks on phylogeny, distribution and biology as well as a brief description of adults and larvae. All known fossil records of Trogossitidae are reviewed and discussed. The work includes maps of distribution, colour photographs of generic representatives, morphological illustrations, SEM photographs and phylogenetic trees.

Keywords

Coleoptera, Cleroidea, Trogossitidae, key, catalogue

Copyright *Jiří Kolibáč*. This is an open access article distributed under the terms of the Creative Commons Attribution International License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Contents

Introduction 5
New taxonomic acts 5
Brief review of classification 6
Annotations to the catalogue, keys and illustrations 6
Family Trogossitidae Latreille, 1802 8
Subfamily Trogossitinae Latreille, 1802 15
Tribe Calityini Reitter, 1922 15
Genus *Calitys* Thomson, 1859 16
Tribe Larinotini Ślipiński, 1992 19
Genus *Larinotus* Carter & Zeck, 1937 20
Tribe Egoliini Lacordaire, 1854 22
Genus *Acalanthis* Erichson, 1844 23
Genus *Calanthosoma* Reitter, 1876 24
Genus *Egolia* Erichson, 1842 26
Genus *Necrobiopsis* Crowson, 1964 27
Genus *Paracalanthis* Crowson, 1970 28
Tribe Gymnochilini Lacordaire, 1854 28
Genus *Anacypta* Illiger, 1807 30
Genus *Gymnocheilis* Dejean, 1835 33
Genus *Kolibacia* Leschen & Lackner, 2013 34
Genus *Leperina* Erichson, 1844 36
Genus *Narcisa* Pascoe, 1863 40
Genus *Phanodesta* Reitter, 1876 41
Genus *Seidlitzella* Jakobson, 1915 44
Genus *Xenoglena* Reitter, 1876 46
Tribe Trogossitini Latreille, 1802 47
Genus *Airora* Reitter, 1876 49
Genus *Alindria* Erichson, 1844 53
Genus *Corticotomus* Sharp, 1891 55
† Genus *Cretocateres* Ponomarenko, 1986 57
Genus *Dupontiella* Spinola, 1844 57
Genus *Elestora* Pascoe, 1868 58
† Genus *Eotenebroides* Ren, 1995 59
Genus *Eupycnus* Sharp, 1891 60
Genus *Euschaefferia* Leng, 1920 60
Genus *Leipaspis* Wollaston, 1862 62
Genus *Melambia* Erichson, 1844 63
Genus *Nemozoma* Latreille, 1804 65
Genus *Parallelodera* Fairmaire, 1881 69
Genus *Temnoscheila* Westwood, 1830 70
Genus *Tenebroides* Piller & Mitterpacher, 1783 78

† Genus *Thoracotes* Handlirsch, 1906 89
† Tribe Lithostomatini Kolibáč & Huang, 2008 90
† Genus *Lithostoma* Martynov, 1926 91
Subfamily Peltinae Latreille, 1806 92
Peltinae *incertae sedis* 93
† Genus *Juralithinus* Kireichuk & Ponomarenko, 1990 93
† Genus *Sinopeltis* Yu, Leschen, Ślipiński, Ren & Pang, 2012 94
Tribe Peltini Latreille, 1806 95
Genus *Peltis* O. F. Müller, 1764 96
Tribe Colydiopeltini Kolibáč, 2006 100
Genus *Colydiopeltis* Ślipiński, 1992 101
Genus *Parapeltis* Ślipiński, 1992 102
Tribe *Phloiophilini* Kiesenwetter, 1863 103
Genus *Phloiophilus* Stephens, 1830 104
Tribe Thymalini Léveillé, 1888 107
Genus *Australiodes* Endrödy-Younga, 1960 108
Genus *Globorentonium* Lawrence & Ślipiński, 2013 110
Genus *Parentonium* Crowson, 1970 110
Genus *Protopeltis* Crowson, 1964 111
Genus *Rentonellum* Crowson, 1966 112
Genus *Rentonidium* Crowson, 1966 113
Genus *Rentonium* Crowson, 1966 114
Genus *Thymalus* Latreille, 1802 115
Subfamily Lophocaterinae Crowson, 1964 117
† Genus *Cretamerus* Peris, Kolibáč & Delclòs 119
Tribe Decamerini Crowson, 1964 119
Genus *Antixoon* Gorham, 1886 120
Genus *Decamerus* Solier, 1849 121
Genus *Diontolobus* Solier, 1849 122
Tribe *Ancyronini* Kolibáč, 2006 124
Genus *Afrocyrona* Kolibáč, 2007 125
Genus *Ancyrona* Reitter, 1876 126
Species groups 127
lewisi species-group 128
gabonica species-group 128
japonica species-group 128
colobicoides species-group 128
endroedyi species-group 129
Genus *Grynoma* Sharp, 1877 132
Genus *Leptonyxa* Reitter, 1876 133
Genus *Neaspis* Pascoe, 1872 135
† Genus *Sinosoronia* Zhang, 1992 137
Tribe Lophocaterini Crowson, 1964 138

Genus *Eronyxa* Reitter, 1876 140
Genus *Grynocharina* Reitter, 1877 142
Genus *Grynocharis* Thomson, 1862 144
Genus *Indopeltis* Crowson, 1966 148
Genus *Lophocateres* Olliff, 1883 149
Genus *Lycoptis* Casey, 1890 153
Genus *Peltonyxa* Reitter, 1876 153
Genus *Promanus* Sharp, 1877 156
† Genus *Promanodes* Kolibáč, Schmied, Wappler & Kubisz, 2010 158
Genus *Trichocateres* Kolibáč, 2010 158
Species *incertae sedis* 159
Taxa occassionally or temporarily classified within Trogossitidae 160
Coleoptera *incertae sedis* 160
† Genus *Anhuistoma* Lin, 1985 160
† Genus *Peltocoleops* Ponomarenko, 1990 165
Superfamily Cucujoidea *incertae sedis* 166
† Subfamily Meligethiellinae Kireichuk & Ponomarenko, 1990 166
† Genus *Meligethiella* Medvedev, 1969 166
† Genus *Ostomalynus* Kireichuk & Ponomarenko, 1990 167
Superfamily Cucujoidea *incertae sedis* 168
† Genus *Palaeoendomychus* Zhang, 1992 168
Family Salpingidae 169
Family Chrysomelidae 169
Family Derodontidae 169
Family Helotidae 170
Family Monotomidae 170
Family Synteliidae 170
Family Zopheridae 171
Phylogeny of the family Trogossitidae 171
Acknowledgements 174
References 175

Introduction

The main purpose of the work is to introduce some modern order into current knowledge of the family Trogossitidae and extend knowledge of this relatively small but fascinating group of beetles, especially to both amateur entomologists and professional "non-cleroid" workers. It is deliberately written as a "compilation" of papers on the topic to date, especially because some of them were published in journals and books that are not easily accessible to all, and to bring various fragmented sources together.

Because of the character and purpose of the work, I have tried to avoid introducing any new thoughts and systematic changes, apart from a few minor ones mentioned in the "New taxonomic acts" section. A catalogue of species lies at the core of the work. I have not repeated references included in *Coleopterorum Catalogus of Temnochilidae* by Léveillé (1910); however, Léveillé's reference always takes first place in any particular reference list. Taxonomic references follow, just as they have been excerpted from Zoological Records after 1910. The catalogues for some species are, without doubt, incomplete. Some references for biology and local distribution must also, perforce, be lacking – I beg, therefore, the kind reader's patience and leniency.

The systematics of Trogossitidae is still in its infancy. There remains a great deal of work to be done in the higher taxonomy, as well as with regard to generic limits, especially in widespread, species-rich genera. *Ancyrona* is a good example of such a genus, distributed from tropical Africa, the Palaearctic, south-eastern Asia to Australia. *Tenebroides* and *Temnoscheila* are further complex taxa, each with more than a hundred described species distributed in both North and South America. On the other hand, there also exists a relatively rich modern material of trogossitids to be collected in various parts of the world, certainly containing plenty of new species. Unfortunately, only a few people are seriously interested in the family and only a few of them, in turn, try to gather and publish further information. Therefore, another purpose of the book is to encourage interest in this highly interesting group of beetles.

Keys to higher taxa may be considered a further major element of this contribution. With the exception of those for subfamilies, these have not been published to date. Although it is not always easy to recognize some species-rich and variable trogossitid genera, I have done my best to use simple and easily-visible features in the keys.

New taxonomic acts

† Meligethiellinae Kireichuk & Ponomarenko, 1990 is resurrected. The subfamily is removed from synonymy with Peltinae: Thymalini and shifted from Cleroidea to Cucujoidea *sensu lato* (including genera †*Meligethiella* Medvedev, 1969 and †*Ostomalynus* Kireichuk & Ponomarenko, 1990; genus †*Juralithinus* Kireichuk & Ponomarenko, 1990 is classified within Trogossitidae: Peltinae *incertae sedis*).

† *Meligethiella* Medvedev, 1969 is removed from Trogossitidae and Cleroidea (species †*M. glabra* Kireichuk & Ponomarenko, 1990, †*M. kovalevi* Kireichuk & Ponomarenko, 1990, †*M. soroniiformis* Medvedev, 1969).

† *Ostomalynus* Kireichuk & Ponomarenko, 1990 is removed from Trogossitidae and Cleroidea (species †*O. ovalis* Kireichuk & Ponomarenko, 1990).

† *Peltocoleops* Ponomarenko, 1990 is removed from Trogossitidae and Cleroidea and classified as Coleoptera *incertae sedis* (species †*Peltocoleops onokhojensis* Ponomarenko, 1990).

Tenebroides bipustulatus (Fabricius, 1801) (var. *impressifrons* Reitter, 1875 syn. n.).
Tenebroides bonvouloiri Léveillé, 1889 (var. *chontalensis* Sharp, 1891 syn. n.).
Tenebroides maroccanus Reitter, 1884 (var. *baillioti* Léveillé, 1903 syn. n.).

Brief review of classification

The superfamily Cleroidea was established by Böving and Craighead (1931). Until that time, Trogossitidae had been classified within Clavicornia together with Nitidulidae (usually as Ostomidae but also as Ostomatidae, Peltidae and Temnochilidae). The names Trogositidae (from Trogositae Fabricius, 1801) and the correct spelling Trogossitidae (from Trogossitarii Latreille, 1802) are the most modern forms of the name (see Kolibáč and Leschen 2010 for details). The family Phloiophilidae is mentioned in Pic's (1926) catalogue of Melyridae *sensu lato* (the family is sometimes referred to as Phloeophilidae as well). Crowson (1964a) discussed the classification of its only species in detail and classified it within modern Cleroidea. I have suggested a classification of Phloiophilidae as a tribe in Peltinae (Kolibáč 2008) but this has not found wide acceptance.

Reitter (1876) published an excellent world-wide review that is basic to the study of Trogossitidae. Similarly, the world catalogue by Léveillé (1910) is among the classic works. The number of genera and species has only slightly increased since the publication of the latter list, even on a world scale. Crowson (1964a, 1966, 1970) has changed the rank or status of subfamilies and families classified within Trogossitidae *sensu lato* several times. Subsequently, Barron (1971) and later Ślipiński (1992) integrated Crowsons's families into the single family Trogossitidae. Several years ago, I established tribes in all trogossitid subfamilies on the basis of the morphological characters of adults and larvae (Kolibáč 2006, 2008). The 2008 system is employed throughout this work.

Annotations to the catalogue, keys and illustrations

Léveillé (1910) is always the first reference in catalogues. Reitter (1876), as the most important reference in some taxa, is also listed. The note "synonymized by author" refers to the author of the preceding reference.

Distribution abbreviations: AD = author of description, AL = A. Léveillé, JK = J. Kolibáč, JRB = J. R. Barron, RAC = R. A. Crowson, varA= other authors.

Table 1. Major classifications of Trogossitidae.

Reitter 1876	Trogositidae = Helotinae + Trogositinae (Nemozomini incl. present Egoliini; Trogositini; Leperini incl. present Calityini; Peltini incl. present Decamerini, Thymalini, Ancyronini) (*Phloiophilus* not addressed in the paper)
Léveillé 1910	Temnochilidae = Nemosominae (incl. present Egoliini) + Temnochilinae + Leperininae (incl. present Calityini) + Ostominae (incl. present Decamerini, Lophocaterini, Ancyronini) + *Lycoptis* (genus *incertae sedis*)
Reitter 1911	Malacodermata: Cantharidae: Dasytinae: *Phloiophilus*
	Clavicornia: Ostomidae
Crowson 1964	Phloiphilidae (included in Cleroidea by Crowson 1955)
	Peltidae = Decamerinae + Peltinae (incl. present Calityini) + Egoliinae
	Trogossitidae = Lophocaterinae + Trogossitinae
Crowson 1966	Peltidae = Egoliinae + Decamerinae + Peltinae + Rentoniinae (Rentoniini, Protopeltini) (Trogossitidae and *Calitys* not treated in the paper)
Crowson 1970	Phloiophilidae
	Trogossitidae = Trogossitinae + Calitinae + Egoliinae
	Peltidae = Decamerinae + Peltinae + Protopeltinae + Rentoniinae
	Lophocateridae (incl. present Lophocaterini, Ancyronini, *Lycoptis*)
Barron 1971	Trogossitidae = Trogossitinae + Peltinae (incl. present Decamerini, Peltini, Thymalini, Lophocaterinae, Calityini)
Ślipiński 1992 (followed by Lawrence & Newton 1995)	Trogossitidae = Peltinae + Lophocaterinae + Larinotinae (incl. present Colydiopeltini) + Protopeltinae + Decamerinae + Rentoniinae + Calitinae + Egoliinae + Trogossitinae
Kolibáč 2006 (followed by Bouchard et al. 2011, incl. †Lithostomatini)	Trogossitidae = Trogossitinae (Calityini, Larinotini, Egoliini, Gymnochilini, Trogossitini) + Peltinae (Peltini, Thymalini incl. Rentoniinae and Protopeltinae, Colydiopeltini, Decamerini, Ancyronini, Lophocaterini) Phloiophilidae not addressed in the paper.
Kolibáč 2008 (used herein)	Trogossitidae = Trogossitinae (Calityini, Larinotini, Egoliini, Gymnochilini, Trogossitini, †Lithostomatini) + Lophocaterinae (Decamerini, Lophocaterini, Ancyronini) + Peltinae (Peltini, Phloiophilini, Colydiopeltini, Thymalini incl. Rentoniinae and Protopeltinae)

More than seven years have passed since I formulated theses on the higher classification of Trogossitidae. Although some opinions about the phylogeny have changed and the systematic placement of some genera has recently been called into question, the main purpose of the keys is confined to identification of the trogossitid genera. The keys are given for extant subfamilies, tribes and genera. Extinct taxa are listed in relevant sections, together with their descriptions and remarks on their classification. Generic names in parentheses in particular descriptions denote a similar character state occuring in another genus or genera.

The morphological descriptions of particular genera are largely based on several hundred detailed ink-drawings that have already been published by myself (Kolibáč 2005, 2006). PDF files of the papers that include them, as well as all other relevant publications since 2000, are available on request (see author's address).

All scale bars in plates (Figs 1–12) express one millimetre. Beetles in colour plates (Figs 3–12) are pictured in approximate proportion ("large species" are larger than "small species"). White arrows in SEM photographs (Figs 13–18) denote important characters further mentioned in relevant captions. Numbers in parentheses in maps of distribution (Maps 1–13) denote the number of species within the given genus.

Family Trogossitidae Latreille, 1802

http://species-id.net/wiki/Trogossitidae

Latreille, P. A. 1802: 110.

Hallan, J. 2007–2012: http://insects.tamu.edu/research/collection/hallan/test/Arthropoda/Insects/Coleoptera/Family/Trogossitidae.txt (check-list). Barron, J. R. 1971: 14. Boosten, G. 1983: 290 (biology). Bouchard, P. et al. 2011: 56 (review of higher taxa). Burakowski, B. et al. 1986: 116. Chûjô, M. & Lee, C. E. 1994: 187 (Korean species). Crowson, R. A. 1955: 82. Crowson, R. A. 1967: 211. Gourves, J. 2006: 56 (biology). Gray, D. W. 2002: 1583 (systematics). Hayes, J. L. J. et al. 2008: 206 (biology). Hieke, F. & Pietrzeniuk, E. 1984: 315 (Baltic amber). Hunt et al. 2007: 1915 (molecular phylogeny). Kireichuk, A. G. & Ponomarenko, A. G. 1990: 79 (Mesozoic fossils). Klimaszewski, J. & Watt, J. C. 1997: 43 (key). Kohnle, U. & Vite, J. P. 1984: 504 (biology). Kolibáč, J. 1993a: 20. Kolibáč, J. 1993b: 89. Kolibáč, J. 2004: (phylogeny). Kolibáč, J. 2005: 39 (morphology of adults). Kolibáč, J. 2006: 117 (morphology of larvae, phylogeny). Kolibáč, J. 2007a: 363 (Palaearctic beetles catalogue). Kolibáč, J. 2009: 127 (nomenclatory). Kolibáč, J. et al. 2005: 25, 129 (Central Europe, key). Kolibáč, J. & Leschen, R. A. B. 2010: 241 (review). Larsson, S. G. 1978: 150 (Baltic amber). Lawrence, J. F. 1982: 519. Lawrence, J. F. et al. 2011: 72 (phylogeny). Lawrence, J. F. & Britton, E. B. 1994: 118. Lawrence, J. F. & Newton, A. F., Jr. 1982: 281 (phylogeny). Lawrence, J. F. & Newton, A. F., Jr. 1995: 867 (review of higher taxa). Lawrence, J. F. et al. 1993: CD ROM (identification of larvae). Lawrence, J. F. et al. 1999a: CD ROM (identification of adults). Lawrence, J. F. et al. 1999b: CD ROM (identification of larvae). Lawrence, J. F. in Stehr F. W. 1991: 448 (larval morphology). Leschen R. A. B. 2002: 263 (review, USA). Léveillé, A. 1910: 1. Lucht, W. 1981: 35. Luna de Carvalho, E. 1979: 80 (key). Majer, K. 1994: 384 (phylogeny, morphology). Merkl, O. 1993: 7 (key). Mitter, H. 1983: 52 (distribution). Nikitsky, N. B. 1980: 43 (key), 92 (larvae). Nikitsky, N. B. 1992: 80 (key). Ponomarenko, A. G. & Kireichuk, A. G. 2004–2008: http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm (list of fossils). Paulian, R. 1998: 120 (key). Reitter, E. 1876: 3 (review, key). Reitter, E. 1922 (key). Schmied, H. et al. 2009: 23 (list of fossil taxa). Ślipiński, S. A. 1992: 440 (key to subfamilies, review of classification). Spahr, U. 1981: 74 (Ostomidae, list of fossils). Stresemann, E. et al. 1989: 270 (key). Tsinkevich, V. A. 1997: 27 (review). Valcarcel, J. P. & Prieto Pilona, F. 2001: 109. Waltz, R. D. 2002: 177. Weidner, H. 1993: 126 (key). Winkler, A. 1927: (Palaearctic beetles catalogue). Zherichin, V. V. 1978: 29 (Mesozoic fossils, Baysa).

Morphology (Figs 1, 2). **Adults** (Fig. 1) (according to Kolibáč and Leschen 2010). Body size: 1.0–35.0 mm. Body wide, flattened in most Peltinae; elongate in most Trogossitinae; small and broadly oval in Larinotini and Decamerini; convex in Thymalini. Body mostly bare or sparsely pubescent but sometimes also with tufts of setae, scales, dense pubescence or long hairs. Head usually not declined, although many members of Thymalini are moderately to strongly conglobate (the *Rentonium* group). Anterior margin of frons straight to very deeply emarginate (*Nemozoma*). Gular sutures widely or narrowly separated or strongly convergent. Posterior edge of epicranium with two incisions or evenly rounded. Frontoclypeal suture present or absent. Antennal insertions partly covered by edge of frons or visible in dorsal view. Subantennal groove conspicuous (receiving from one to three antennomeres), reduced or absent. Eyes not emarginate or (rarely) posteriorly emarginate, flat to elevated; sometimes divided by canthus into dorsal and ventral eyes (as in Gyrinidae and some Cerambycidae). Labrum broadly oval to oblong, mostly slightly emarginate; epipharynx consisting mainly of a cordate sclerite; tormae connected, or not, at centre by tormal bridge. Antennae 8- to 11-segmented, with conspicuous 1- to 3-segmented club or with widened distal antennomeres that may be asymmetrical. Three to five apical antennomeres often bear sensorial fields. Mandible with one or two, rarely three, apical teeth; usually with ventral ciliate furrow; prostheca well-developed (brush of setae), reduced to absent; mola present, reduced or absent. Maxilla with distinct galea and lacinia; galea sometimes with ciliate or denticulate setae; lacinia with one to three apical hooks or with spine-like setae or with dense soft pubescence; basistipes more or less coalescent with lacinia or free; palpifer denticulate along outer margin (in Trogossitinae); apical palpomere conical or cylindrical. Male submentum with tuft of setae in some Trogossitinae; ligula membranous, rigid or coalescent with prementum; apex of ligula deeply or shallowly emarginate, often with ciliate setae; palpi conical or cylindrical, rarely weakly securiform. Tentorial arms connected by bridge or bridge reduced. Cervical sclerites present. Pronotum usually transverse; elongate only in some Trogossitinae. Lateral carinae almost always present, often denticulate; reduced only in some Trogossitinae (*Corticotomus*). Prosternal process apically dilated or narrowed. Procoxa slightly to strongly transverse. Coxal cavities internally open and externally closed or widely open. Notosternal suture complete. Trochantin elongate, exposed. Mesonotum distinct, with transverse scutum and well-developed scutellar shield. Elytra usually regularly punctate, with or without conspicuous carinae; epipleura well-developed or reduced in posterior half; elytra of Trogossitinae with interlocking mechanism along apical part of suture. Mesoventrite wide, with distinct prepectus. Mesocoxae usually projecting. Mesanepisternum triangular, not extending to mesocoxal cavity. Mesepimeron triangular, usually reaching coxal cavities, so that these are laterally open (cavities closed by meeting of mesoventrite and metaventrite in Egoliini). Metaventrite more or less flattened, with distinct discrimen and transverse katepisternal suture; subcoxal lines present in *Colydiopeltis, Larinotus,* and *Thymalus*. Metanepisternum longitudinal, often with carina at centre. Metacoxae extending laterally to meet elytral epipleura, often with longitudinal furrow at centre.

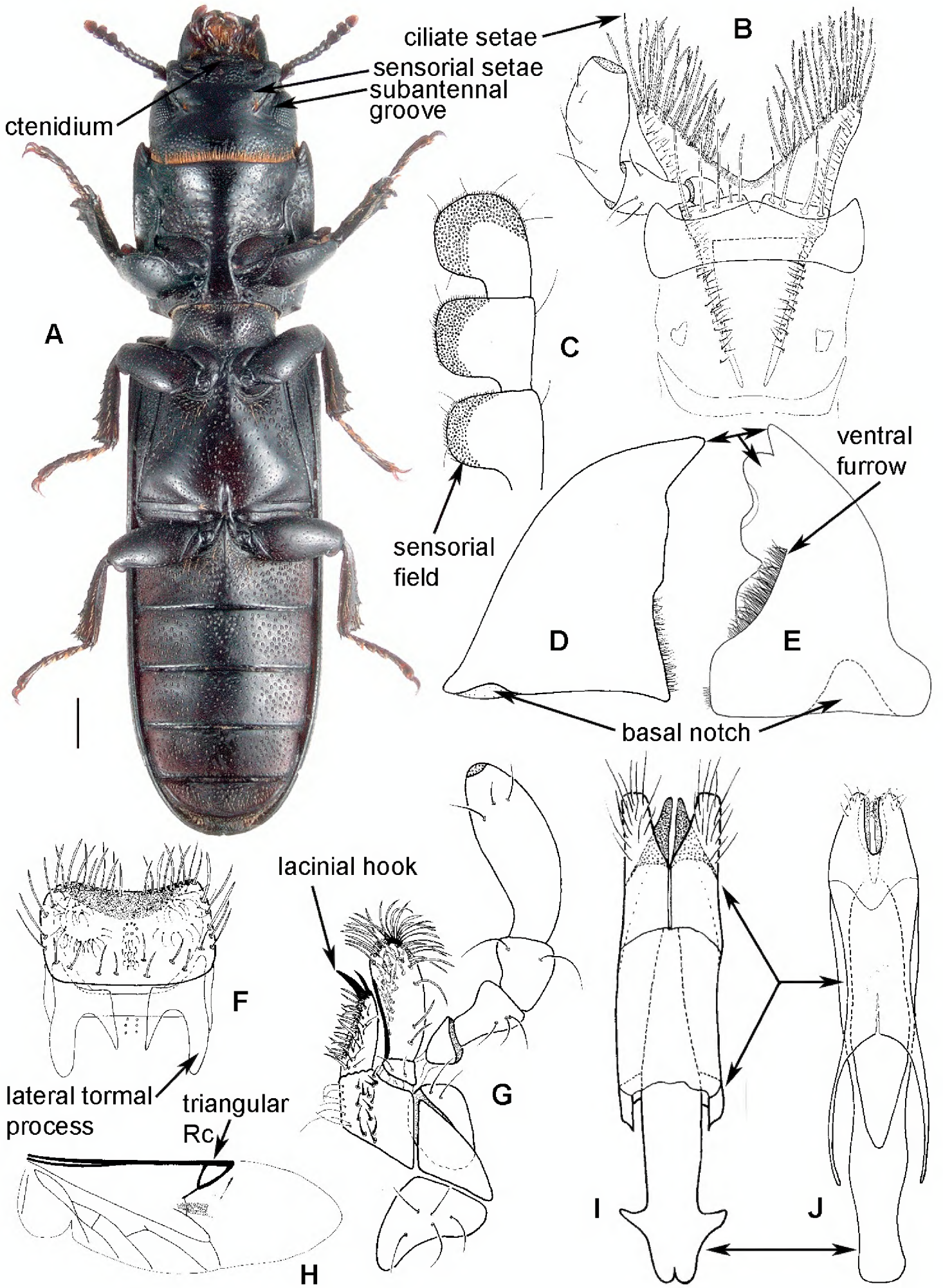


Figure 1. Adult morphology: **A** *Alindria* sp. from Laos, ventral surface **B** *Leipaspis lauricola*, labium **C** *Airora cylindrica*, antennal club **D** *Corticotomus cylindricus*, mandible dorsally **E** *A. cylindrica*, mandible ventrally **F** *Acalanthis quadrisignata*, labium **G** *A. quadrisignata*, maxilla **H** *A. quadrisignata*, wing **I** *Peltonyxa deyrollei*, tegmen composed of 3 parts **J** *A. cylindrica*, tegmen composed of 2 parts.

Metendosternite with conspicuous lateral arms. Wings usually present, but missing in some species. Apical field sometimes with one or more small sclerites just beyond radial cell; RP2 sometimes present. Radial cell as long as wide or shorter than wide, sometimes very reduced or absent; cross-vein r3 usually absent. Basal portion of RP short or sometimes absent. Medial field with as many as four free veins, a wedge cell and no medial fleck (fewer veins and no wedge cell in smaller species); anal embayment usually notch-like, absent in some Trogossitini. Trochanters triangular. Femora sometimes clavate. Tibiae often with row of spines along outer side; apex of tibia with row of spines and two hooked spurs or only one spur hooked or spurs reduced (spines reduced in smaller taxa); tibial spurs pattern varies from 2-2-2 to 0-0-0. Tarsi 5-5-5; tarsomere 1 sometimes partially fused with 2 but always with conspicuous suture between them or very small and tarsal pattern seemingly 4-4-4 or 4-4-5; tarsomeres 1–4 never with membranous lobes; apical tarsomere usually as long as combined length of tarsomeres 1–4; claws large, without denticles (with the exception of some Decamerinae); empodium bisetose, strongly projecting. Abdomen with five or six ventrites. Ventrites I–III fused. Intercoxal process small, narrow. Spiculum of ventrite VIII sometimes present in males and always in females. Segment IX well-developed or reduced to "spicular fork". Aedeagus sheath-like cucujiform type, with fixed or articulated parameres that may be partly or entirely fused together or absent. Tegmen usually with anterior ventral strut and two opposing dorsal struts ("double tegmen" of Crowson 1964a), but usually inverted (rarely uninverted or placed laterally) and often composed of two or three parts (undivided in some members of the *Rentonium* group). Penis with two anterior struts. Ovipositor lightly sclerotized, except for baculi, moderate in size with sparsely pubescent coxites and styli. Bursa copulatrix large, spherical. Spermatheca elongate or oval, with gland. Vagina without sclerites. Six malpighian tubules present in *Tenebroides* and *Lophocateres*.

Larvae (Fig. 2) (according to Kolibáč and Leschen 2010). Five to seven larval instars observed in Trogossitinae (*Temnoscheila*, *Tenebroides*), four instars in Lophocaterinae (*Lophocateres*), all beetles reared in laboratory conditions. Body elongate, only weakly flattened. Colour white or pale, but sclerotised areas distinctly pigmented (head capsule, thoracic and abdominal terga, and urogomphi). Vestiture consisting of setae; rarely with bristles or expanded setae; sometimes body with short and sparse pubescence or only with setae on the last segment. Head protracted. Posterior edge of capsule slightly emarginate. Epicranial stem absent or present and of variable length. Median endocarina usually present, of variable length and usually extending between frontal arms (absent in *Thymalus* and/ or coincident with epicranial stem and frontal arms in Peltinae); paired endocarinae present or absent. Frontal arms V-shaped, straight or curved (nearly S-shaped). Five stemmata usually present and arranged in a pattern with two anteriorly and three in a posterior row; sometimes reduced to four, three, two or none. Frontoclypeal suture usually absent (distinct in the *Rentonium* group and *Thymalus*). Labrum free; epipharynx membranous; shape of tormae variable and lacking posterior extensions. Antennae 3-segmented, with short sensorium present at apex of segment 2. Mandibles with

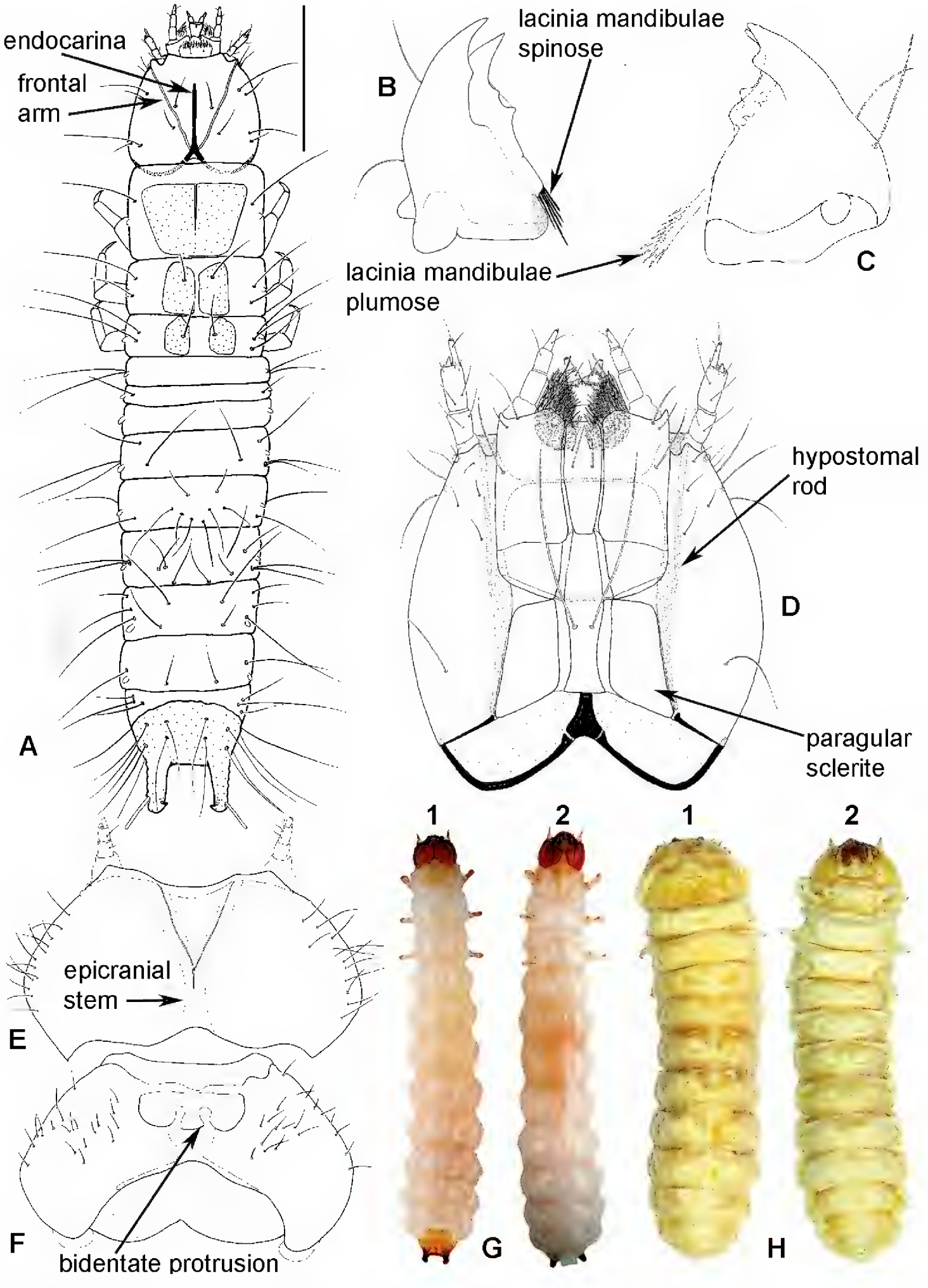


Figure 2. Larval morphology: **A** *Tenebroides* "*fuscus*", dorsal surface **B** *T.* "*fuscus*", mandible ventrally **C** *Lophocateres pusillus*, mandible ventrally **D** *T.* "*fuscus*", head ventrally **E–F** *Peltis ferruginea*, head capsule (**E** dorsally **F** ventrally) **G** *Ancyrona diversa* (**1** dorsally **2** ventrally) **H** *Peltis ferruginea* (**1** dorsally **2** ventrally).

one or two apical teeth (serrate in the *Rentonium* group); mola absent or present; mesal edge of mandibular base with brush of hairs or rigid denticulate processes that may be hylaline. Ventral mouthparts retracted. Maxillary articulating area present or absent. Cardo typically undivided (divided in *Calitys*). Mala with apex usually simple, with large pedunculate seta in predatory species (Trogossitini and Egoliini); inner apical angle usually lacking small teeth (present in *Protopeltus* and Larinotini); palps with four, three (e.g., *Ancyrona* and *Lophocateres*), or two (*Rentonium* group) palpomeres. Labium consisting of prementum, mentum, and submentum, or pre- and postmentum (*Thymalus* and *Parapeltis*); mentum or postmentum free or connate with base of maxillae; prementum sclerotized and elongate; mentum mostly unsclerotized in some taxa; ligula absent or present; if present apex emarginate or not, or divided apically; palps usually 2-segmented (1-segmented in the *Rentonium* group). Gular region longer than wide, or wider than long; fused to labium or not. Hypostomal rods present, reduced or absent; sometimes extending to posterior edge of head; subparallel or diverging posteriorly. Ventral epicranial ridges present or absent. Prothorax usually with one large sclerite dorsally and one elongate sclerite ventrally. Protergum with or without sclerotized plate with a longitudinal median ecdysial line. Meso- and metathorax usually with pair of sclerites dorsally (absent in some taxa) and one weakly sclerotised, pale plate ventrally. Sometimes all thoracic sclerites indistinct. Coxae widely separated. Thoracic legs 5-segmented, including claw-like pretarsus with single seta. Nine abdominal segments visible from above. Abdominal ampullae present or absent. Segment IX shorter than or subequal to VIII. Segment X almost always concealed by segment IX (visible from above only in *Larinotus*). Urogomphi usually well-developed (sometimes reduced) and dorsally or posteriorly oriented; large, hook-shaped or nearly straight; strongly sclerotized and pigmented; often with spines or secondary processes; apically bifurcate or not; pit present between urogomphi in *Parapeltis*; median process present between urogomphi in Lophocaterini and urogomphi located at apex of median process in some members of the *Rentonium* group. Anal region posteriorly or posterioventrally oriented; paired pygopods on segment X absent. Six malpighian tubules in *Tenebroides*; four in *Lophocateres*.

Key to subfamilies

Identification of the trogossitid subfamilies using the various determination keys published by a range of authors tends to be a complicated and frustrating process. Unfortunately, my "lumping" of nine former subfamilies (e.g., Ślipiński 1992) in two (Kolibáč 2006) rather complicated the identification of the individual specimen. In the traditional system for the trogossitids used in the 19th century (e.g. Erichson, Reitter, Léveillé), Peltinae were flat and fungivorous whereas Trogossitinae were cylindrical and predatory. Further study of such modified taxa as the rentoniins, decamerins or colydiopeltins revealed huge morphological and biological diversity within Peltinae (*sensu* Kolibáč 2006). The same situation holds in Trogossitinae, in which

superficially different taxa (such as *Calitys*, *Larinotus*, the gymnochilins and egoliins) are classified together in one subfamily. The subfamily Lophocaterinae was established by Crowson (1964a) and synonymized with Peltinae by Kolibáč (2006) because of possible paraphyly of the latter subfamily. Later, in response to new observations, we suggested (Kolibáč 2008, Kolibáč and Zaitsev 2010) that Peltinae be split once more into Lophocaterinae and Peltinae. The latter is the system used in this book.

Similar ways of life (members of the both subfamilies tend to be predatory), reductions of morphological structures common to the whole order Coleoptera (e.g. wing venation, lateral edge of pronotum, mola), mosaic character patterns and probably some underlying synapomorphies complicate the definition of subfamilies even other higher taxa in Trogossitidae, in much the same way as they do in the related family Cleridae. The key that follows is therefore not based on absolutely inclusive synapomorphies. The most important, clearly-visible characters appear in **bold type**.

1 Adult: labium with rigid ligula; epipharynx mostly with cordate sclerite along apex of labrum; **antennal club mostly conspicuously asymmetrical,** terminal antennomeres (antennal club) mostly with sensorial fields; **front coxal cavities externally closed;** body cylindrical or oval but not conglobate; end of elytral suture with distinct interlocking mechanism ("elytral lock"). Larva: **head capsule with distinct endocarina,** gular sutures and hypostomal rods; frontal arms mostly straight; **gular region mostly with paragular sclerites.** Mainly predatory, rarely fungivorous or phytophagous (e.g. feeding on grains)..... **Trogossitinae**

– Adult: labium with membranous ligula; epipharynx without cordate sclerite; **antennal club weakly asymmetrical or symmetrical,** terminal antennomeres (antennal club) without distinct sensorial fields; **front coxal cavities mostly externally open** (except for Lophocaterinae: Decamerini); body often oval and flat (but sometimes also convex or conglobate); elytral suture without distinct interlocking mechanism. Larva: **head capsule mostly without endocarina;** gular sutures and hypostomal rods reduced; frontal arms often curved; **gular region without paragular sclerites** **2**

2 Adult: **frontoclypeal suture absent or inconspicuous;** gular sutures wide, subparallel; eyes moderate, not distinctly elevate; antennal club symmetrical; radial cell oblong, moderate; tibial spines along sides mostly reduced; body flat, convex or conglobate. Larva: **lacinia mandibulae tridentate, absent or minute.** Fungivorous or phytophagous..... **Peltinae**

– Adult: **frontoclypeal suture present, sometimes distinctly emarginate** (or concave); gular sutures wide, convergent at apex; eyes almost elevate, laterally situated; antennal club weakly asymmetrical; radial cell moved downwards, towards wing centre, sometimes small or reduced; tibial spines along sides present; body always flat. Larva: **lacinia mandibulae plumose, always distinct.** Primitive members fungivorous or phytophagous, advanced ones floricolous or predatory..... **Lophocaterinae**

Subfamily Trogossitinae Latreille, 1802

Latreille, P. A. 1802: 110.

See "Family Trogossitidae" section for further references.

A key to the extant tribes of Trogossitinae

1 Elytral interlocking mechanism absent or weak; antennal club loose, symmetrical; dorsal surface flat, with tufts of setae and tubercles. Fungivorous ... . **Calityini**

– Elytral interlocking mechanism present; antennal club asymmetrical (or compact and symmetrical); dorsal surface convex, with scales or regularly pubescent or bare. Predatory, rarely phytophagous **2**

2 Middle coxal cavities closed; dorsal surface mostly with very long hairs **3**

– Middle coxal cavities open; dorsal surface bare, with sparse pubescence or with scales..... **4**

3 Antennal club compact and symmetrical; tibiae with reduced apical spurs; gular sutures wide, convergent at apex. Larva without paragular sclerites..... **Larinotini**

– Antennal club asymmetrical; tibiae with conspicuous apical spurs; gular sutures narrow, subparallel at apex. Known larvae with paragular sclerites..... **Egoliini**

4 Eyes more/less dorsally situated, some genera with 2 pairs of eyes; body surface distinctly regularly sculptured or covered with scales or with short, thick setae; elytra with distinct carinae; anterior margin of pronotum always deeply emarginate ..... **Gymnochilini**

– Eyes laterally situated, rather flat, always only single pair of eyes present; body surface finely punctate or wrinkled, without scales or thick setae; elytra without carinae or with weak carinae; anterior margin of pronotum emarginate or not ..... **Trogossitini**

Tribe Calityini Reitter, 1922

Reitter, E. 1922: 66.

Type genus. *Calitys* Thomson, 1859

Bouchard, P. et al. 2011: 57. Crowson, R. A. 1970: 13 (referred as Calitinae subfam.nov.). Ślipiński, S. A. 1992: 442 (Calitinae). Lawrence, J. F. & Newton, A. F., Jr. 1995: 869 (Calitinae). Kolibáč, J. 2006: 117 (Calityni Winkler, 1922; *sic*!) (diagnosis, new status). Kolibáč, J. 2007a: 364. Kolibáč, J. & Leschen, R. A. B. 2010: 242.

Remarks. The position of the single genus *Calitys* within the trogossitid system has changed many times over the past century or so. It has been classified within either Peltinae or Trogossitinae (compare, for example, Barron 1971 and Crowson 1964a *vs*. Crowson 1970), then treated as a separate subfamily (Crowson 1970 in Trogossitidae *s.str.*

without Peltidae, Ślipiński 1992 in Trogossitidae *s.lat.*). Reitter's early idea (1876) that it might be classified within the former Leperini or Leperinae (i.e. Gymnochilini herein) is also interesting and worthy of review. *Calitys* belongs among the primitive fungivorous groups and has several features shared with Peltinae, for example: robust mandibles with mola, flat body, wide pronotum, weakly asymmetrical antennal club, and absence of elytral interlocking mechanism. However, it also has bizarre sculptures on dorsal surface of body, wax scales, and tufts of rigid setae that together differentiate the genus from all other trogossitids. Its basal position in the trogossitine branch is based chiefly on procoxal cavities perfectly externally closed, presence of paragular sclerites in larval cranium and concave larval tergite IX. Wax scales and tufts of setae on head, antennae, elytra, and pronotum make it resemble Gymnochilini. Nonetheless, it remains possible to imagine *Calitys* also as a derived member of Peltinae or even Lophocaterinae.

Genus *Calitys* Thomson, 1859
http://species-id.net/wiki/Calitys
Figs 3, 13; Map 1

Calitys Thomson, C. G. 1859: 71.

Type species. *Hispa scabra* Thunberg, 1784 [by original designation and monotypy]

Barron, J. R. 1971: 18. Crowson, R. A. 1964a: 296. Kolibáč, J. 2005: 49 (redescription). Kolibáč, J. 2006: 111 (phylogeny). Kolibáč, J. 2007a: 364. Kolibáč, J. 2008: 118–119 (phylogeny). Kolibáč, J. et al. 2005: 129 (key). Léveillé, A. 1910: 24. Reitter, E. 1911: 6, 7 (*Calytis* Thomson, 1859: misspelling; see Barron, J. R. 1971: 19). Reitter, E. 1922: 66. Spahr, U. 1981: 74 (amber and copal fossils).

Nosodes LeConte, 1861 [type species: no species included; see Barron 1971]

Barron, J. R. 1971: 19. Reitter, E. 1876: 43.

Peltidea Motchulsky, 1858 [type species: *Peltidea dentata* Fabricius, 1787]

Barron, J. R. 1971: 18. (*nomen oblitum*)

Description (*C. scabra*). Body size: about 10.0 mm. Adult: Body shape flat. Gular sutures wide, convergent at apex. Frontoclypeal suture present. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum: ctenidium absent. Antennal groove present. Eyes: size moderate. Eyes number: two. Epicranial acumination deep. Lacinial hooks: two. Galea: shape sub-clavate. Galea: ciliate setae absent. Mediostipes-Lacinia partially fused. Palpifer: outer edge even. Mandibular apical teeth number: two, horizontally situated. Mola present. Penicillus (at base) present (fine, often membranous). Pubescence above mola or cutting edge absent. Ventral furrow present. Basal notch shallow or absent. Labrum-Cranium not fused. Epipharyngial sclerite absent. Lateral tormal process: projection curved downwards, processes with bridge (*Peltis*). Ligula: ciliate setae absent. Ligula rigid, strongly retroflexed, weakly emarginate. Hypopharyngeal sclerite H-shaped. Antenna 11-segmented. Antennal club symmetrical, sensorial fields absent. Front coxal cavi-

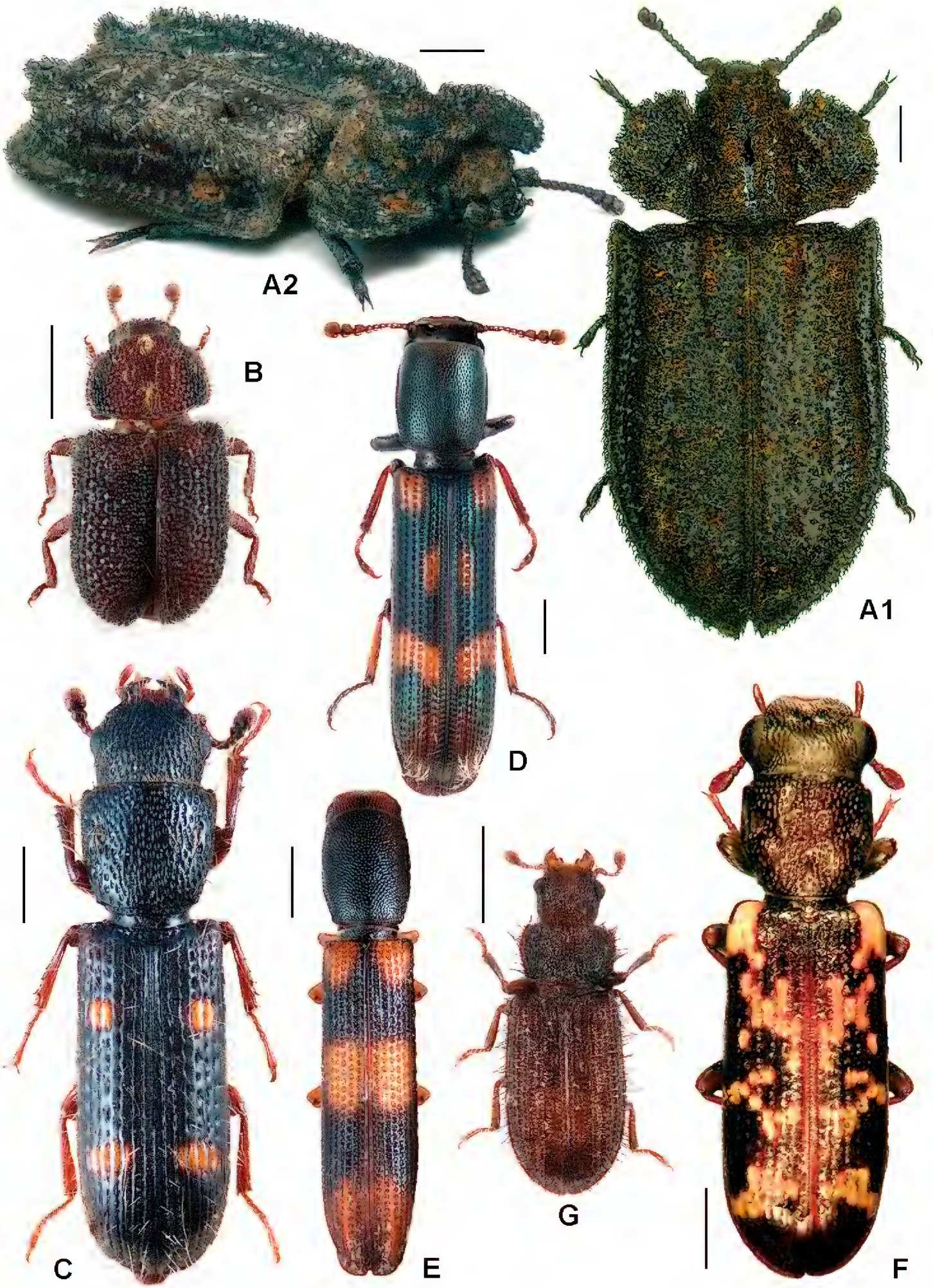
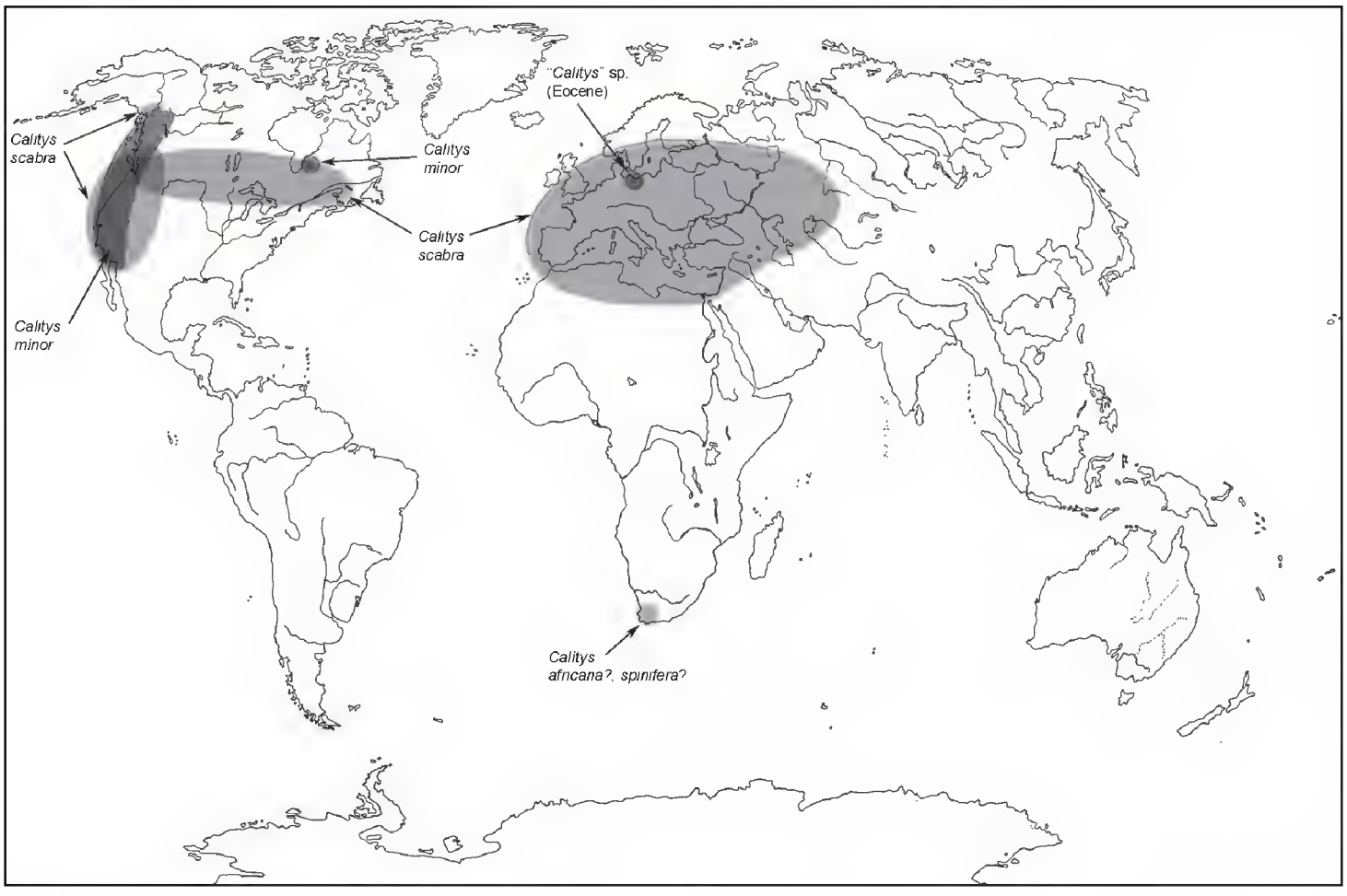


Figure 3. A *Calitys scabra* **B** *Larinotus umblicatus* **C** *Acalanthis quadrisignata* **D** *Calanthosoma flavomaculata* **E** *Calanthosoma* (syn. *Marnia*) *sipolisi* **F** *Egolia variegata* **G** *Necrobiopsis tasmanicus*.



Map 1. A distribution of the tribe Calityini.

ties externally closed, internally open. Pronotum transverse. Prepectus present. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron wide. Elytral interlocking mechanism absent, carinae conspicuous. Elytral punctation regular, scales present. Wing: radial cell oblong (or reduced), wedge cell small (*Peltis*), cross vein MP3-4 present, cross vein AA1+2-3+4 absent. Front tibiae: spines along side moderate. Hooked spur present. Claws: denticle absent. Parasternites number along ventrites III–VII: two. Spiculum gastrale present. Tegmen composed of three parts.

Larva: Frontal arms weakly curved. Epicranial stem absent. Endocarina present. Gular sutures conspicuous, parallel. Gula: anterior apodemes absent. Paragular sclerites present. Hypostomal rods absent. Stemmata number: five. Mandibular apical teeth number: two, horizontally situated. Lacinia mandibulae absent. Mola reduced. Maxillary palpi 3-segmented. Cardo-Stipes not fused. Cardo: size much smaller than stipes. Ligula present. Labial palpi 2-segmented. Antennal joints 1 and 2 elongate. Sensory appendix very small. Thoracic sclerites pattern (dorsally) 1-2-2. Thoracic sclerites pattern (ventrally) 0+0+0. Trochanter oblong. Abdominal segment IX not divided. Tergite IX flat. Urogomphi present, hooked; median process absent.

Biology. Fungivorous. Live under bark of old coniferous trees (fir, pine) and on tree fungi. *Calitys scabra* was observed together with its larvae, for example, in the old stump of a fir *Abies alba* in Slovakia (J. Vávra, pers. observ.). Brustel (2009) recorded it from *Antrodia* sp. polypore fungi in Pyrenées Mts.

Distribution. Two species Holarctic. Two more species also reported from South Africa, of which *C. spinifera* is unknown to me. I studied a single *C. africana* non-type specimen in the Musée d'Histoire Naturelle in Geneva in 2003. It does not belong to Cleroidea.

Species:

africana Boheman, 1848; Caffraria (AL)

Léveillé, A. 1910: 24. Kolibáč, J., 2003: unpublished observation of non-type specimen in MHN Geneve: not Cleroidea. Reitter, E. 1876: 44. (*Nosodes africana*)

minor Hatch, 1962; USA, Canada (JRB)

Barron, J. R. 1971: 23. Hatch, M. H. 1962: 189

scabra Thunberg, 1784; Europe, Siberia to Far East, North Africa(?), USA, Canada (varA)

Léveillé, A. 1910: 24. Barron, J. R. 1971: 19. Barron, J. R. 1971: 20 (syn. *Bolitophagus silphides* Newman, 1838, synonymized by whom?). Barron, J. R. 1971: 20 (syn. *Peltis serrata* LeConte, 1859, synonymized by whom?). Barron, J. R. 1971: 20 (syn. *Silpha dentata* Fabricius, 1787, synonymized by whom?). Borowiec, L. 1983: 11. Brustel, H. 2009: 227–232 (biology). Burakowski, B. et al. 1986: 118. Dajoz, R. 1997: 44 (ecology). Hansen, S. O. & Borgersen, B. 1991: 40 (distribution in Norway). Klausnitzer, B. 1976: 5. Klausnitzer, B. 1996: 155 (larva). Klausnitzer, B. 1978: 176. Kolibáč, J. 1993a: 20 (key). Kolibáč, J. 1993b: 90. Kolibáč, J. 2005: 49 (redescription). Kolibáč, J. 2006: 106 (larva). Kolibáč, J. 2007a: 364. Kolibáč, J. et al. 2005: 132 (key). Mitter, H. 1998: 560. Pileckis, S. & V. Monsevičius 1995: 273. Reitter, E. 1876: 44 (*Nosodes*). Vogt, H. 1967: 16

spinifera Reitter, 1877; Cap (AL)

Léveillé, A. 1910: 24

Calitys sp

Beutel, R. G. & Pollock, D. A. 2000: 826 (larva, morphology). Beutel, R. G. & Ślipiński, S. A. 2001: 219

†"*Calitys*" sp

Larsson, S. G. 1978: 150 (fossil, Baltic amber)

Tribe Larinotini Ślipiński, 1992

Larinotini Ślipiński, S. A. 1992: 443 (Larinotinae)

Type genus. *Larinotus* Carter & Zeck, 1937

Bouchard, P. et al. 2011: 57. Lawrence, J. F. & Newton, A. F., Jr. 1995: 868 (Larinotinae). Kolibáč, J. 2006: 118 (Larinotini) (diagnosis, stat. n.). Kolibáč, J. 2008: 118–119 (phylogeny). Kolibáč, J. & Leschen, R. A. B. 2010: 242.

Remarks. The subfamily Larinotinae was originally established for the genera *Colydiopeltis*, *Parapeltis* and *Larinotus* (Ślipiński 1992). I removed the first two genera into the separate tribe Colydiopeltini under Peltinae (Kolibáč 2006), leaving Larinotini monotypic. Ślipiński (*l.c.*) remarked upon the similarity of the adult *Larinotus* and *Necrobiopsis* (Trogossitinae: Egoliini) but, on the other hand, he also pointed out common features of the *Larinotus* larva and some Peltinae (Rentoniinae, *Protopeltis* in his original text). Crowson (1970) also classified *Larinotus* (described as *Nebophilus hirsutus*) within Egoliini. All the opinions of the both these authors are in perfect

agreement with my observations (Kolibáč 2006, 2008). Finally, character analyses (*l.c.*) also resulted in a close relationship between Larinotini and Egoliini. The relationship of adults appears to be so close that one might speculate about the paraphyly of Larinotini; it is, however, hard to justify such a hypothesis if one considers the monotypy of the latter (all derived features found in *Larinotus* are only autapomorphies).

The closed mesocoxal cavities are the single apomorphy distinguishing Larinotini from adult Egoliini. Larval characters connecting *Larinotus* with Peltinae are: (1) cranium with median endocarina, (2) gula with anterior apodemes, (3) strongly reduced urogomphi (minute, apices downturned). However, character states 1 and 2 are considered plesiomorphies while the third character state (reduction of urogomphi) could be a tendency observed in various cleroids living in tightly-confined surroundings (e.g. *Peltis*, Cleridae: *Dermestoides*).

Genus *Larinotus* Carter & Zeck, 1937
http://species-id.net/wiki/Larinotus
Fig. 3; Map 2

Carter, H. J. & Zeck, E. H. 1937: 186. (*sub* Colydidae)

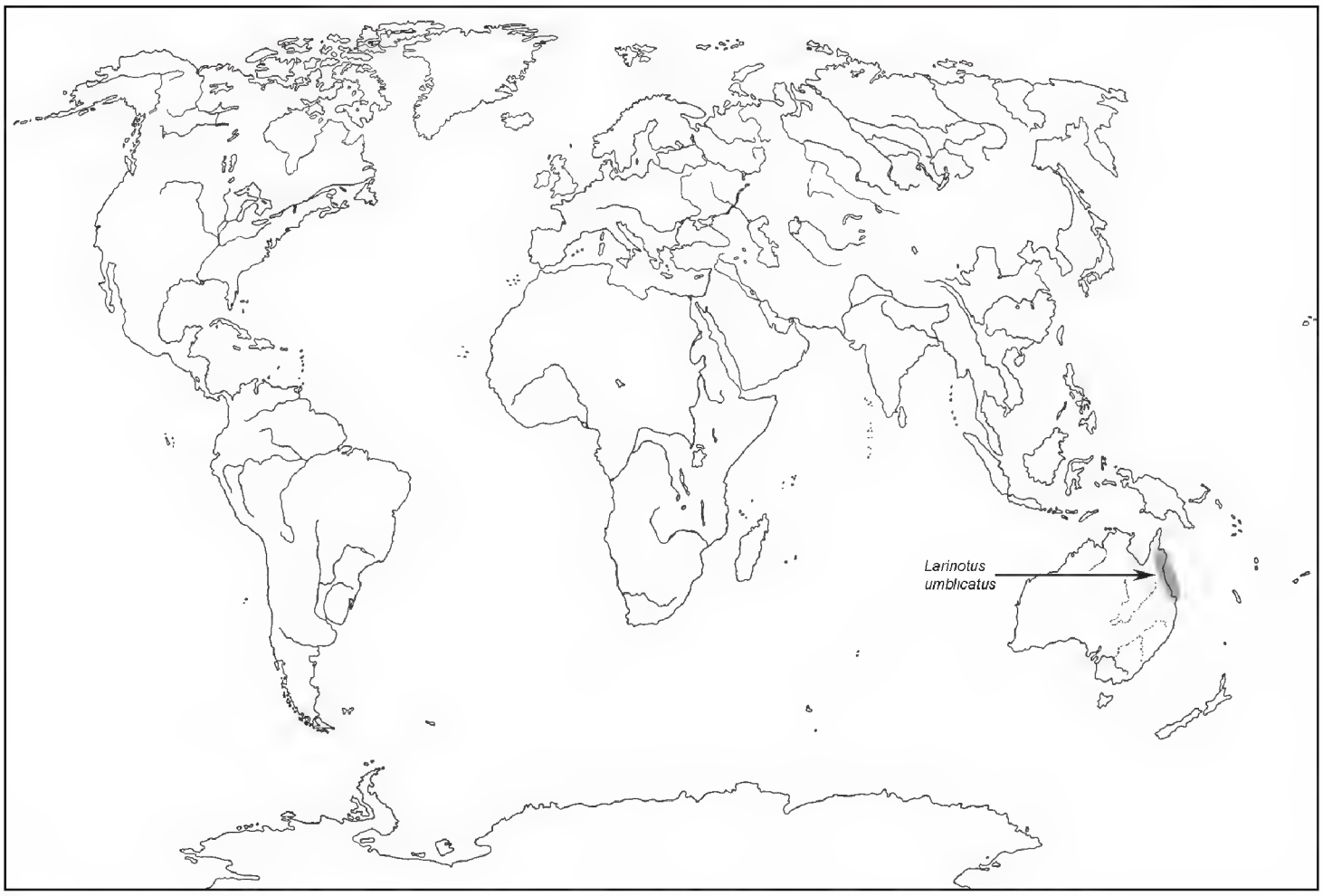
Type species. *Larinotus umblicatus* Carter & Zeck, 1937 [by monotypy]

Kolibáč, J. 2005: 62 (redescription). Kolibáč, J. 2006: 111 (phylogeny). Ślipiński, S. A. 1992: 455 (redescription).

Nebophilus Crowson, 1970 [type species: *Nebophilus hirsutus* Crowson, 1970; designated by author]

Crowson, R. A. 1970: 14. Lawrence, J. F. 1980: 307 (synonymized with *L. umblicatus*)

Description (see also Crowson 1970, Ślipiński 1992). Body size: 3.5 mm. Body shape convex (not conglobate). Gular sutures wide, convergent at apex. Frontoclypeal suture present. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum: ctenidium absent. Antennal groove present. Eyes: size moderate. Eyes number: two. Epicranial acumination moderate. Lacinial hooks: two. Galea: shape elongate. Galea: ciliate setae absent. Mediostipes-Lacinia not fused. Palpifer: outer edge even. Mandibular apical teeth number: two, horizontally situated. Mola present. Penicillus (at base) absent. Pubescence above mola or cutting edge absent. Ventral furrow absent. Basal notch shallow or absent. Labrum-Cranium not fused. Epipharyngial sclerite absent. Lateral tormal process: projection curved downwards, processes with bridge (*Peltis*). Ligula: ciliate setae absent. Ligula rigid, not retroflex, weakly emarginate. Hypopharyngeal sclerite consisting of two separate parts. Antenna 9-segmented. Antennal club symmetrical, sensorial fields absent. Front coxal cavities externally closed, internally open. Pronotum transverse. Prepectus absent. Middle coxal cavities closed. Elytra: long hairs present. Epipleuron moderate. Elytral interlocking mechanism present, carinae reduced. Elytral punctation regular, scales absent. Wing: radial cell triangular, wedge cell present, cross vein MP3-4 absent, cross



Map 2. A distribution of the tribe Larinotini.

vein AA1+2-3+4 present. Front tibiae: spines along side reduced, hooked spur present. Claws: denticle absent. Spiculum gastrale absent. Tegmen composed of two parts.

Larva: Frontal arms weakly curved. Epicranial stem reduced. Endocarina present. Gular sutures conspicuous, parallel. Gula: anterior apodemes present. Paragular sclerites absent. Hypostomal rods absent. Stemmata number: five. Mandible apical teeth number: two, horizontally situated. Lacinia mandibulae with several small spines. Mola absent. Maxillary palpi 3-segmented. Palpifer present. Pedunculate seta absent. Mala simple. Mala: bidentate protrusion absent. Cardo-Stipes not fused. Cardo: size much smaller than stipes. Ligula absent. Labial palpi 2-segmented. Prementum in single part, anterior margin projecting. Torma: two separate lateral sclerites. Antennal joints 1, 2 transverse. Sensory appendix larger than half of joint 3. Thoracic sclerites pattern (dorsally) 0+0+0. Thoracic sclerites pattern (ventrally) 0+0+0. Trochanter triangular. Abdominal segment IX not divided. Tergite IX depressed. Urogomphi minute; median process absent.

Biology. The larvae and adults were found together by J. Doyen "*in rotten wood beneath resupinate fungi*" (Ślipiński 1992).

Distribution. Australia: Northern Queensland.

Species:

umblicatus Carter & Zeck, 1937; Australia: Queensland (varA)

Carter, H. J. & Zeck, E. H. 1937: 186. Crowson, R. A. 1970: 16 (*Nebophilus hirsutus*). Lawrence, J. F. 1980: 307 (syn. *Nebophilus hirsutus* Crowson, 1970; synonymized by author). Ślipiński, S. A. 1992: 455 (redescription adult, description larva). Kolibáč, J. 2005: 62

Tribe Egoliini Lacordaire, 1854

Lacordaire, J. T. 1854: 334.

Type genus. *Egolia* Erichson, 1842

Arias, E. et al. 2009: 37. Bouchard, P. et al. 2011: 57. Crowson, R. A. 1964a: 287 (Egoliinae). Lawrence, J. F. & Newton, A. F., Jr. 1995: 869 (Egoliinae). Ślipiński, S. A. 1992: 442 (Egoliinae). Kolibáč, J. 2006: 106, 119 (larval morphology; stat. n.; phylogeny). Kolibáč, J. 2008: 118–119 (phylogeny).

Remarks. This tribe exhibits several primitive features (for example, mandibles with distinct mola) and belongs among the basal groups of Trogossitinae. While earlier entomologists always classified *Acalanthis*, *Egolia* and *Calanthosoma* together with *Nemozoma* and allied genera (for example, in the "Nemozomini" of Reitter 1876 and "Nemosomatinae" of Léveillé 1910), i.e. they always associated the present tribe with Trogossitinae, Crowson (1964a, 1966) was convinced of a relationship to Peltidae. His main reason was perhaps the relative primitiveness of adult egoliins with respect to trogossitids *s.lat.* Later, Crowson (1970) transferred it to Trogossitidae *s.str.*, together with his newly-established subfamily Calitinae (in fact, only a change of status for Calityini Reitter, 1922). Having examined larvae of Egoliinae (*Acalanthis*, *Paracalanthis*) I consider its classification with modern trogossitins undeniable.

Key to genera

1 Pronotum distinctly elongate; antennae 11-segmented, club 3-segmented with sensorial fields; elytra bare, long hairs at elytral apex only ..... ***Calanthosoma***

– Pronotum cordate or transverse; antennae 8- or 10-segmented, club 1- or 2-segmented without sensorial fields; elytra and pronotum with long hairs or, rarely, perfectly bare **2**

2 Pronotum transverse; frontoclypeal suture present; antennae 8-segmented, club 1-segmented (composed of 3 united segments) ..... ***Necrobiopsis***

– Pronotum cordate; frontoclypeal suture absent; antennae 10-segmented, club 2-segmented **3**

3 Dorsal surface bare ..... ***Egolia***

– Dorsal surface with long, pale hairs **4**

4 Head, pronotum and elytra black or elytral apex dark blue; each elytron with two orange spots or with two transverse bands composed of light pubescence ..... ***Acalanthis***

– Head, pronotum and elytra brown; elytra with X-shaped yellowish spot in anterior half and transverse yellowish stripe in apical half ..... ***Paracalanthis***

Genus *Acalanthis* Erichson, 1844
http://species-id.net/wiki/Acalanthis
Figs 1, 3, 13; Map 3

Erichson, W. F. 1844: 446.

Type species. *Acalanthis quadrisignata* Erichson, 1844 [by monotypy]

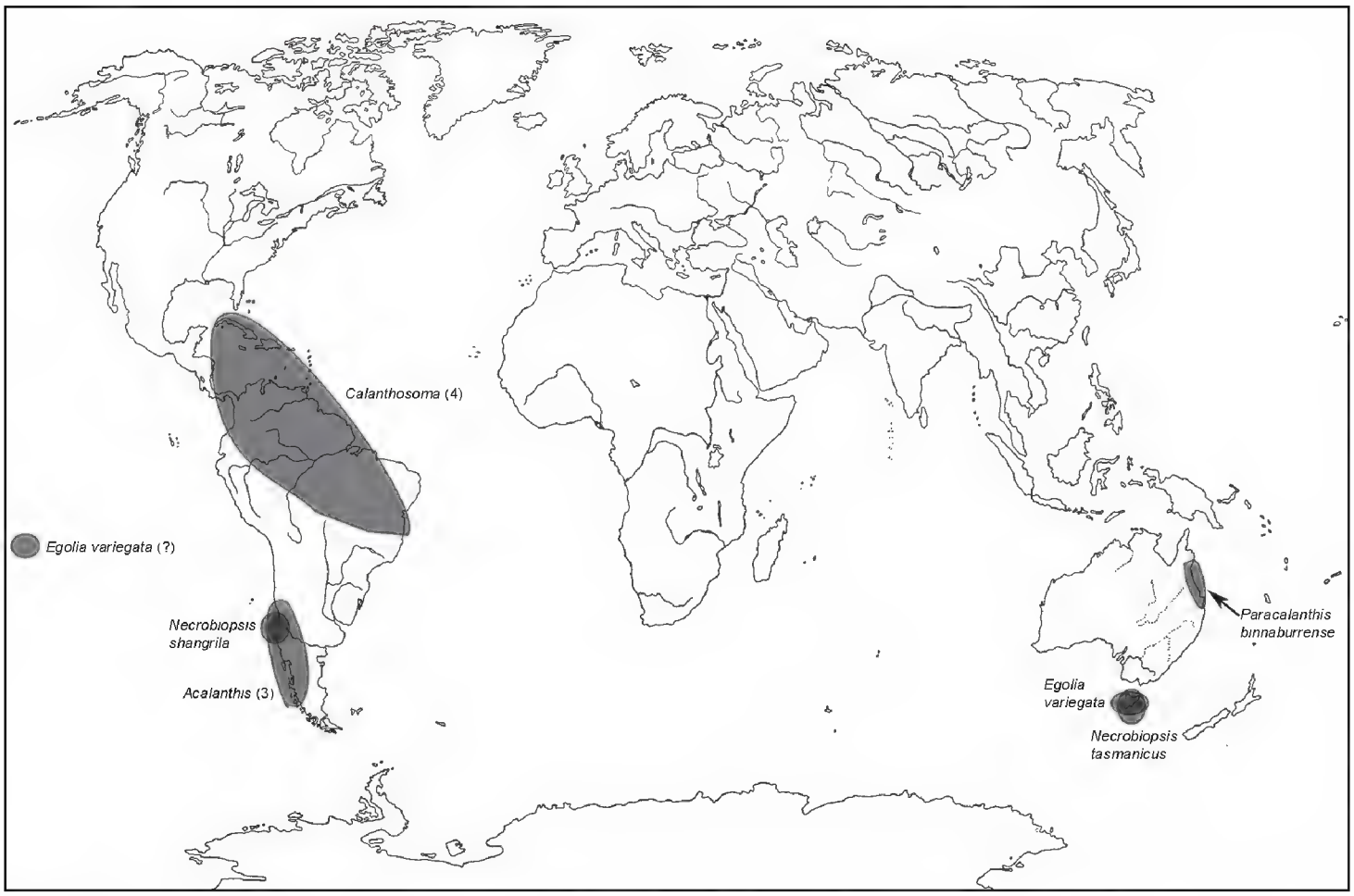
Léveillé, A. 1910: 4. Arias, E. et al. 2009: 39. Crowson, R. A. 1964a: 299 (larva, described as *Phanodesta*). Crowson, R. A. 1970: 13. Kolibáč, J. 2005: 40. Kolibáč, J. 2006: 106 (larva; see Crowson 1964a).

Remarks. An antennal apex I figured (Kolibáč 2005: 89, Pl. 1-Fig. 5) was associated with *Acalanthis quadrisignata* in error, as correctly noted by Arias et al. (2009). The drawing probably belongs to *Calanthosoma flavomaculata*.

Description. Body size: 6.0–9.0 mm. Body shape elongate. Gular sutures narrow, subparallel at apex. Frontoclypeal suture absent. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides present. Submentum: ctenidium absent. Antennal groove present. Eyes: size moderate Eyes number: two. Epicranial acumination moderate. Lacinial hooks: two. Galea: shape sub-clavate. Galea: ciliate setae absent. Mediostipes-Lacinia partially fused. Palpifer: outer edge even. Mandibular apical teeth number: two, horizontally situated. Mola reduced but present. Penicillus (at base) present (fine, often membranous). Pubescence above mola or cutting edge present. Ventral furrow present. Basal notch moderate. Labrum-Cranium not fused. Epipharyngial sclerite present. Lateral tormal process: projection curved downwards, processes not connected (*Airora*). Ligula: ciliate setae absent. Ligula rigid, weakly retroflex, deeply emarginate. Hypopharyngeal sclerite H-shaped. Antenna 10-segmented, Antennal club asymmetrical, sensorial fields present. Front coxal cavities externally closed, internally open. Pronotum cordate. Prepectus absent. Middle coxal cavities closed. Elytra: long hairs present. Epipleuron moderate. Elytral interlocking mechanism present, carinae reduced. Elytral punctation regular, scales absent. Wing: radial cell triangular, wedge cell present, cross vein MP3-4 present, cross vein AA1+2-3+4 absent. Front tibiae: spines along side moderate. Hooked spur present. Claws: denticle absent. Parasternites number along ventrites III–VII: one. Spiculum gastrale absent. Tegmen composed of three parts. Coxitae undivided.

Larva: Frontal arms V-shaped. Epicranial stem reduced. Endocarina present. Antennal joints 1 and 2 elongate. Thoracic sclerites pattern (dorsally) 1-2-2. Tergite IX depressed. Urogomphi present, hooked; median process absent.

Biology. Predatory. Crowson (1964a) remarked "*numerous insect fragments in gut*" of an assumed *Phanodesta* larva but, as he noted later (1970: 1), the larva probably belongs to some species of *Acalanthis*. Its brief description in his key (1964a: 299) in fact agrees perfectly with the larval characters of Egoliini. The adult gut contents of *A. quadrisignata* included insect fragments (Crowson 1964a). Elizabeth Arias and colleagues (Arias et al. 2009) caught numerous *Acalanthis* specimens by canopy fogging



Map 3. A distribution of the tribe Egoliini.

and beating vegetation in forests, yielding a range of species including some *Nothophagus*, *Araucaria*, *Schinus*, and *Rhaphitamnus*.

Distribution. Temperate forests of central Chile and Argentina (Arias et al. 2009).

Species:

mirabilis Reitter, 1876; Chile (AL, varA)
Léveillé, A. 1910: 4. Arias, E. et al. 2009: 40

quadrisignata Erichson, 1844; Chile (AL, varA)
Léveillé, A. 1910: 4. Arias, E. et al. 2009: 39. Kolibáč, J. 1999b: 12. Kolibáč, J. 2005: 40 (redescription)

semimetallica Fairmaire, 1861 (*Clerus*); Chile (AL, varA)
Léveillé, A. 1910: 4. Arias, E. et al. 2009: 41

Genus *Calanthosoma* Reitter, 1876

http://species-id.net/wiki/Calanthosoma
Fig. 3; Map 3

Reitter, E. 1876: 10.

Type species. *Calanthosoma flavomaculatum* Reitter, 1876 [by monotypy]
Léveillé, A. 1910: 4. Arias, E. et al. 2009: 37. Kolibáč, J. 2005: 47 (redescription). Kolibáč, J. 2006: 111 (phylogeny).

Marnia Léveille, 1889 [Type species: *Marnia sipolisi* Léveillé, 1889; designated by Kolibáč 2005]

Léveillé, A. 1910: 14. Kolibáč, J. 2005: 47 (synonymized with *Calanthosoma*).

Remarks. A single genus, it lives in tropical South America beyond the temperate "Gondwanan" distribution of the other egoliine genera. *Calanthosoma* shows a character set intermediate between Egoliini and Trogossitini. Longitudinal wrinkles on the dorsal surface of head and pronotum, long hairs at apex of elytra, mandibles with mola, and lacinia with distinct hooked spine at apex are typical of the egoliins; however, the genus shares ciliate labial setae and terminal antennomeres with sensorial fields with most of trogossitins. Nevertheless, most of apomorphic characters are clearly egoliine and I have no doubts about its classification within that tribe. Common trogossitine features of *Calanthosoma* may provide evidence of a common ancestor for Egoliini and Trogossitini.

The synonymization of *Marnia* with *Calanthosoma* is beyond doubt; the representatives of the genera are very similar.

Description. Body size: about 9.0 mm. Body shape elongate. Gular sutures narrow, subparallel at apex. Frontoclypeal suture absent. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides present. Submentum of males: ctenidium present. Antennal groove present. Eyes: size moderate. Eyes number: two. Epicranial acumination moderate. Lacinial hooks: one. Galea: shape clavate. Galea: ciliate setae present. Mediostipes-Lacinia partially fused. Palpifer: outer edge even. Mandibular apical teeth number: two, vertically situated. Mola present. Penicillus (at base) present (fine, often membranous). Pubescence above mola or cutting edge absent. Ventral furrow not ciliate. Basal notch moderate. Labrum-Cranium not fused. Epipharyngial sclerite present. Lateral tormal process: projection curved downwards, processes not connected (*Airora*). Ligula: ciliate setae absent. Ligula rigid, weakly retroflex, weakly emarginate. Hypopharyngeal sclerite consisting of two separate parts. Antenna 11-segmented. Antennal club asymmetrical, sensorial fields present. Front coxal cavities externally closed, internally open. Pronotum cordate. Prepectus absent. Middle coxal cavities closed. Elytra: long hairs present. Epipleuron moderate. Elytral interlocking mechanism present, carinae conspicuous. Elytral punctation regular, scales absent. Wing: radial cell oblong (or reduced), wedge cell present, cross vein MP3-4 present, cross vein AA1+2-3+4 absent. Front tibiae: spines along side moderate. Hooked spur present. Claws: denticle absent. Parasternites number along ventrites III–VII: one. Spiculum gastrale absent. Tegmen composed of three parts. Coxitae undivided.

Biology. Unknown, probably predatory.

Distribution. Only a few specimens is known to date: Venezuela, Brazil, Antilles.

Species:

flavomaculatum Reitter, 1876; Antillae, Venezuela (AL, JK)

Léveillé, A. 1910: 4. Kolibáč, J. 2005: 47 (redescription). Reitter, E. 1876: 11

grouvellei Léveille, 1899 (*Marnia*); Brazil (AL)

Léveillé, A. 1910: 14

sallei Léveille, 1889 (*Marnia*); Venezuela (AL)

(J. Kolibáč, unpublished note: maybe synonymous with *C. flavomaculatum*)

sipolisi Léveille, 1889 (*Marnia*); Brazil: Minas Geraes (AL)

Léveillé, A. 1910: 14. Kolibáč, J. 2005: 47

Genus *Egolia* Erichson, 1842

http://species-id.net/wiki/Egolia

Fig. 3; Map 3

Erichson, W. F. 1842: 150.

Type species. *Egolia variegata* Erichson, 1842 [by monotypy]

Léveillé, A. 1910: 4. Crowson, R. A. 1970: 13. Kolibáč, J. 2005: 54. Kolibáč, J. 2006: 111 (phylogeny). Reitter, E. 1876: 8.

Description. Body size: about 9.0 mm. Body shape elongate. Gular sutures narrow, subparallel at apex. Frontoclypeal suture absent. Frons: longitudinal groove or depression absent. Submentum: ctenidium absent. Antennal groove present. Eyes: size moderate. Eyes number: two. Epicranial acumination moderate. Lacinial hooks: two. Galea: shape sub-clavate. Galea: ciliate setae absent. Mediostipes-Lacinia partially fused. Palpifer: outer edge even. Mandibular apical teeth number: two, horizontally situated. Mola present. Penicillus (at base) present (fine, often membranous). Pubescence above mola or cutting edge present. Ventral furrow present. Basal notch moderate. Labrum-Cranium not fused. Epipharyngial sclerite present. Lateral tormal process: projection curved downwards, processes not connected (*Airora*). Ligula: ciliate setae absent. Ligula rigid, weakly retroflexed, deeply emarginate. Hypopharyngeal sclerite H-shaped. Antenna 10-segmented. Antennal club asymmetrical, sensorial fields present. Front coxal cavities externally closed, internally open. Pronotum cordate. Prepectus absent. Middle coxal cavities closed. Elytra: long hairs absent. Epipleuron moderate. Elytral interlocking mechanism present, carinae reduced. Elytral punctation regular, scales absent. Wing: radial cell triangular, wedge cell present, cross vein MP3-4 present, cross vein AA1+2-3+4 absent. Front tibiae: spines along side reduced. Hooked spur absent, apical spurs not hooked or weakly hooked. Claws: denticle absent. Parasternites number along ventrites III–VII: one. Spiculum gastrale absent. Tegmen composed of three parts.

Larva: Frontal arms V-shaped. Epicranial stem absent. Endocarina present. Gular sutures conspicuous, parallel. Gula: anterior apodemes absent. Paragular sclerites present. Hypostomal rods absent. Stemmata number: 3. Mandibular apical teeth number: two, horizontally situated. Lacinia mandibulae absent. Mola absent. Maxillary palpi 3-segmented. Palpifer present. Pedunculate seta absent. Mala bilobed. Mala: bidentate protrusion absent. Cardo-Stipes not fused. Cardo: size much smaller than stipes. Ligula absent. Labial palpi 2-segmented. Prementum consists of two parts. Torma: single compact plate. Antennal joints 1 and 2 elongate. Sensory appendix medium-sized (reaching half-way along joint 3). Thoracic sclerites pattern (dorsally) 1-2-2. Tro-

chanter triangular. Abdominal segment IX not divided. Tergite IX depressed. Urogomphi present, hooked; median process absent.

Biology. Probably predatory.

Distribution. Australia: Tasmania; Tahiti?

Species:

variegata Erichson, 1842; Tasmania, Tahiti (AL)

Léveillé, A. 1910: 4. Kolibáč, J. 2005: 54 (redescription). Reitter, E. 1876: 8

Genus *Necrobiopsis* Crowson, 1964

http://species-id.net/wiki/Necrobiopsis

Fig. 3; Map 3

Crowson, R. A. 1964a: 293.

Type species. *Necrobiopsis tasmanicus* Crowson, 1964 [by original designation and monotypy]

Arias, E. et al. 2009: 39. Crowson, R. A. 1970: 14. Kolibáč, J. 2005: 71 (redescription). Kolibáč, J. 2006: 111 (phylogeny).

Description. Body size: 3.0–4.5 mm. Body shape convex (not conglobate). Gular sutures narrow, subparallel at apex. Frontoclypeal suture present. Frons: longitudinal groove or depression absent. Submentum: ctenidium absent. Antennal groove present. Eyes: size large, lateral. Eyes number: two. Epicranial acumination moderate. Lacinial hooks: two. Galea: shape elongate. Galea: ciliate setae absent. Mediostipes-Lacinia not fused. Palpifer: outer edge even. Mandibular apical teeth number: two, vertically situated. Mola reduced but present. Penicillus (at base) present (fine, often membranous). Pubescence above mola or cutting edge absent. Ventral furrow present. Basal notch shallow or absent. Labrum-Cranium not fused. Epipharyngial sclerite present. Lateral tormal process: projection curved downwards, processes not connected (*Airora*). Ligula: ciliate setae absent. Ligula membranous, not retroflexed, weakly emarginate. Hypopharyngeal sclerite H-shaped. Antenna 8-segmented, sensorial fields present. Front coxal cavities externally closed, internally open. Pronotum transverse. Prepectus present. Middle coxal cavities closed. Elytra: long hairs present. Epipleuron thin. Elytral interlocking mechanism present, carinae conspicuous. Elytral punctation regular, scales absent. Wing: radial cell triangular, wedge cell absent, cross vein MP3-4 present, cross vein AA1+2-3+4 absent. Front tibiae: spines along side reduced. Hooked spur absent, apical spurs not hooked or weakly hooked. Claws: denticle absent. Parasternites number along ventrites III–VII: two. Spiculum gastrale present. Tegmen composed of two parts.

Biology. Unknown in *N. tasmanicus*. The recently described Chilean species *Necrobiopsis shangrila* was collected by canopy fogging in *Nothophagus* forests, including fogging of *Cyttaria* fungi on *Nothophagus* (Arias et al. 2009).

Distribution. Tasmania, central Chile (Region VIII, Biobío).

Species:

tasmanicus Crowson, 1964; Tasmania (RAC)

Crowson, R. A. 1964a: 293. Arias, E. et al. 2009: 38. Kolibáč, J. 2005: 71 (redescription)
shangrila Arias, Ślipiński, Lawrence & Elgueta, 2009; Chile (AD)
Arias, E. et al. 2009: 39.

Genus *Paracalanthis* Crowson, 1970
http://species-id.net/wiki/Paracalanthis
Map 3

Crowson, R. A. 1970: 14.

Type species: *Paracalanthis binnaburrense* Crowson, 1970 [by original designation and monotypy]
Kolibáč, J. 2005: 74. Kolibáč, J. 2006: 116 (phylogeny).
Description. Body size: about 12.0 mm. Body shape elongate. Frontoclypeal suture absent. Frons: longitudinal groove or depression absent. Antennal groove present. Eyes: size moderate. Eyes number: two. Antenna 10-segmented. Front coxal cavities externally closed, internally open. Pronotum cordate. Middle coxal cavities closed. Elytra: long hairs present. Epipleuron thin, carinae reduced. Elytral punctation regular, scales absent. Front tibiae: spines along side moderate. Hooked spur absent in middle and hind tibiae. Claws: denticle absent.
Biology. Unknown. Collected "*from decayed log*" (Crowson 1970).
Distribution. Australia: Queensland.
Species:
binnaburrense Crowson, 1970; Australia: Queensland (RAC)
Crowson, R. A. 1970: 14, 16 (larva). Kolibáč, J. 2005: 74. Kolibáč, J. 2006: 108 (larva).

Tribe Gymnochilini Lacordaire, 1854

Lacordaire, J. T. 1854: 344.

Type genus. *Gymnochila* Erichson, 1844 (= *Gymnocheilis* Dejean, 1835)
Bouchard, P. et al. 2011: 57. Burakowski, B. et al. 1986: 118 (Gymnochilinae). Kolibáč, J. 2006: 119 (diagnosis, stat. n.). Kolibáč, J. 2007a: 364. Kolibáč, J. 2008: 118–119 (phylogeny). Leschen, R. A. B. & Lackner, T. 2013: 283.
Remarks. Five genera of Gymnochilini (namely *Anacypta*, *Gymnocheilis*, *Narcisa*, *Xenoglena*, *Leperina*) form, beyond doubt, a monophyletic group. Gymnochilins constitute an advanced group of Trogossitinae, adapted to a predatory way of life. They are rapid flyers, dwelling on fallen logs and hunting for bostrichids, scolytids and other insects, strongly resembling the jewel beetles (Buprestidae) in their body shape and movement. Two distinctly separated pairs of eyes in most of them and their ability to jump (*Anacypta*) characterize the tribe as one of the most advanced of all trogossitids.

Some remarks about the independent status of the tribe Gymnochilini with regard to Trogossitini are made below, in the section relating the latter tribe.

The inclusion of *Phanodesta* from Juan Fernandez Isl. was more or less confirmed by two separate character analyses (Kolibáč 2006, 2008). However, the phylogeny of the genus was rendered unclear by the number of autapomorphies (e.g. winglessness, characteristic elytral structure) and separated distribution. I postulated a a sister group of *Leperina* with a "Gondwanan" distribution (Australia-Chile). Recently, a phylogeny and distribution of *Phanodesta*, together with descriptions and combinations of some more species from New Zealand and its vicinity have been addressed by Leschen and Lackner (2013) in detail. Two more genera occured in the gymnochiline clade in my second analysis (Kolibáč 2008): *Seidlitzella* and *Melambia*. The first genus, *Seidlitzella*, was considered related to the Palaearctic species of *Leperina*, as also pointed out by Schawaller (1993). However, his formal synonymization of *Seidlitzella* was not confirmed in a recent study by Leschen and Lackner (2013) who established the new genus *Kolibacia* for *Leperina tibialis* and *L. squamulata* instead.

In both analyses by Kolibáč (2006, 2008), the genera *Seidlitzella* and *Melambia* were considered primitive or basal among the Gymnochilini or Trogossitini. They were included in the trogossitins in my original tribe definition (Kolibáč 2006). A comparison made specifically for the current shows the heterogenity of *Melambia* species and the need for revision of the genus with respect to the systematic position of particular species. It cannot be excluded that there are some species of *Melambia* congeneric with *Alindria*.

Key to genera

1 Head with 1 pair of eyes. Ventral part of cranium with long setae at sides. Radial cell triangular and moved down, or reduced. Elytra with conspicuous carinae ... **2**

– Head with 2 pairs of eyes. Ventral part of cranium without long setae at sides. Radial cell mostly oblong. Elytral carinae reduced or inconspicuous **5**

2 Body bare, without setae. Window punctures absent. Unicolorous, black species ..... ***Seidlitzella***

– Body surface with vestiture consisting of scales or setae or both. Window punctures absent or present. Dorsal side brown or black-brown, with colour patterns formed by vestiture **3**

3 Dorsal vestiture consisting of scales. Elytral carinae not beaded; intercarinal space punctate; window punctures present. Mucro absent **4**

– Dorsal vestiture consisting of setae, scales or both. Elytral carinae usually beaded; intercarinal space apunctate; window punctures absent. Mucro absent or weakly developed ..... ***Phanodesta***

4 Elytral intercarinal space bipunctate; window punctures simple. Protibial edge smooth. Mandibles with mola ..... ***Kolibacia***

– Elytral intercarinal space multipunctate; window punctures tuberculate. Protibial edge spinate. Mandibles without mola ..... ***Leperina***

5 Body rather flat, compact; smaller species (about 4–8 mm) **6**
– Body rather cylindrical, elongate; larger species (about 6–20 mm) 7
6 Body perfectly covered with large scales ..... ***Narcisa***
– Body without scales or pubescence, with metallic lustre ..... ***Anacypta***
7 Body with colour pattern composed of scales and short thick setae; antennal club large ..... ***Gymnocheilis***
– Body without scales, spots on pronotum and elytra formed by short setae; antennal club smaller ..... ***Xenoglena***

Genus *Anacypta* Illiger, 1807

http://species-id.net/wiki/Anacypta
Figs 4, 14; Map 4

Illiger, J. K. W. 1807: 301.

Type species. *Nitidula punctata* Fabricius, 1801 [designated by Kolibáč 2005]

Kolibáč, J. 2005: 44 (redescription). Kolibáč, J. 2006: 111 (phylogeny). Kolibáč, J. 2007a: 364.

Acrops Dalman, 1824 [Type species: *Acrops metallica* Dalman, 1824 (= *Nitidula punctata* Fabricius, 1801)]

Léveillé, A. 1910: 23.

Description. Body size: about 4.5–7.0 mm. Body shape flat. Gular sutures wide, convergent at apex. Frontoclypeal suture absent. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum: ctenidium present. Antennal groove present. Eyes: size large, dorsal. Eyes number: four. Epicranial acumination moderate. Lacinial hooks absent. Galea: shape clavate. Galea: ciliate setae absent. Mediostipes-Lacinia partially fused. Palpifer: outer edge denticulate. Mandibular apical teeth number: two, horizontally situated. Mola absent. Penicillus (at base) present (fine, often membranous). Pubescence above mola or cutting edge absent. Ventral furrow absent. Basal notch shallow or absent. Labrum-Cranium not fused. Epipharyngial sclerite absent. Lateral tormal process: projection projection not developed (all remaining). Ligula: ciliate setae absent. Ligula rigid, weakly retroflexed, weakly emarginate. Hypopharyngeal sclerite consisting of two separate parts. Antenna 10-segmented. Antennal club asymmetrical, sensorial fields present. Front coxal cavities externally closed, internally open. Pronotum transverse. Prepectus absent. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron thin. Elytral interlocking mechanism present, carinae reduced. Elytral punctation regular, scales absent. Wing: radial cell oblong (or reduced), wedge cell absent, cross vein MP3-4 absent, cross vein AA1+2-3+4 present. Front tibiae: spines along side reduced. Hooked spur present. Claws: denticle absent. Parasternites number along ventrites III–VII: one. Spiculum gastrale absent. Tegmen composed of three parts. Coxitae undivided.

Biology. Predatory. Adults run rapidly on logs and branches of fallen trees, hunting for prey. If disturbed, they fly very quickly. Some beetle collectors remark (P. Pacholátko,

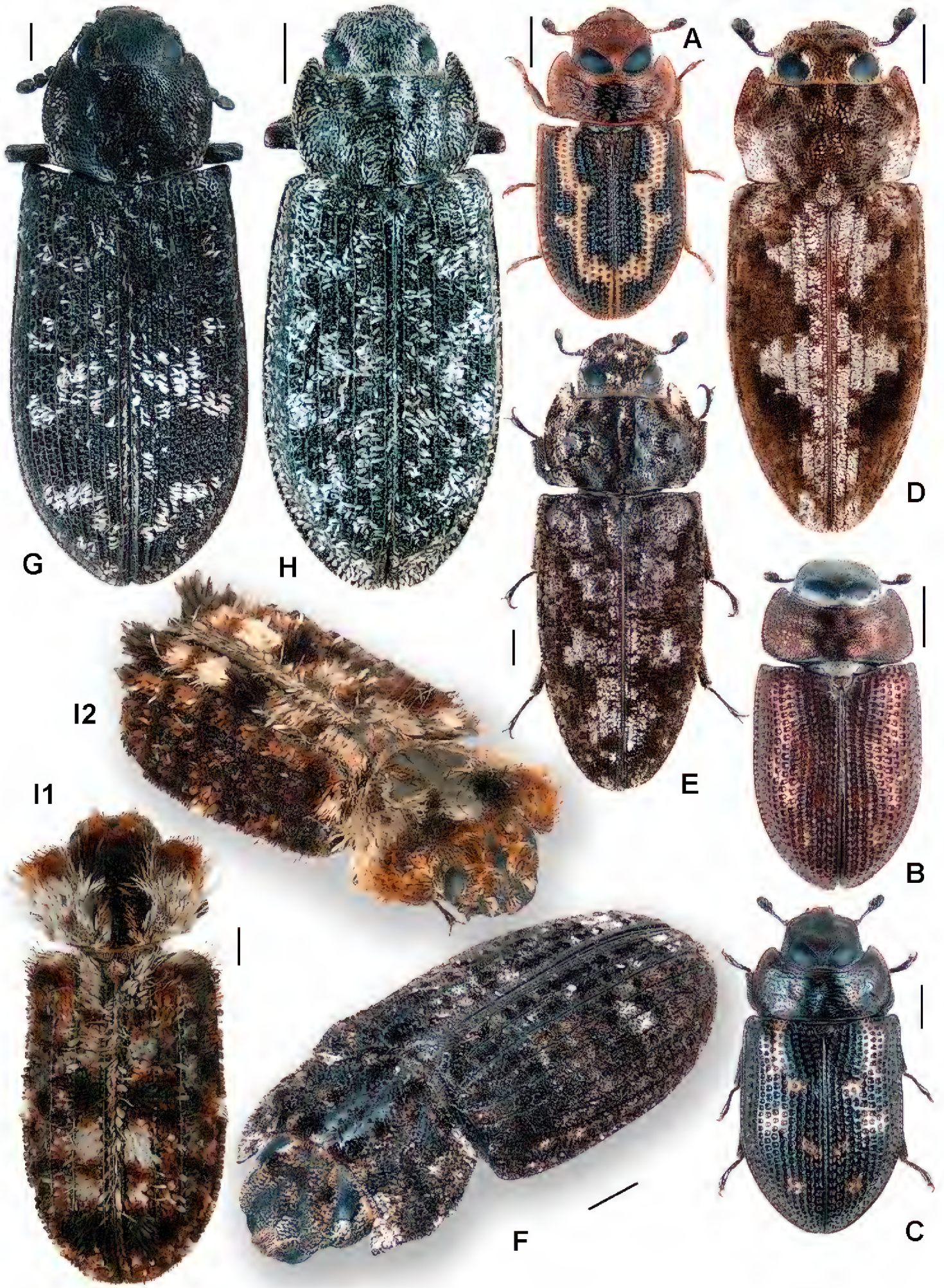
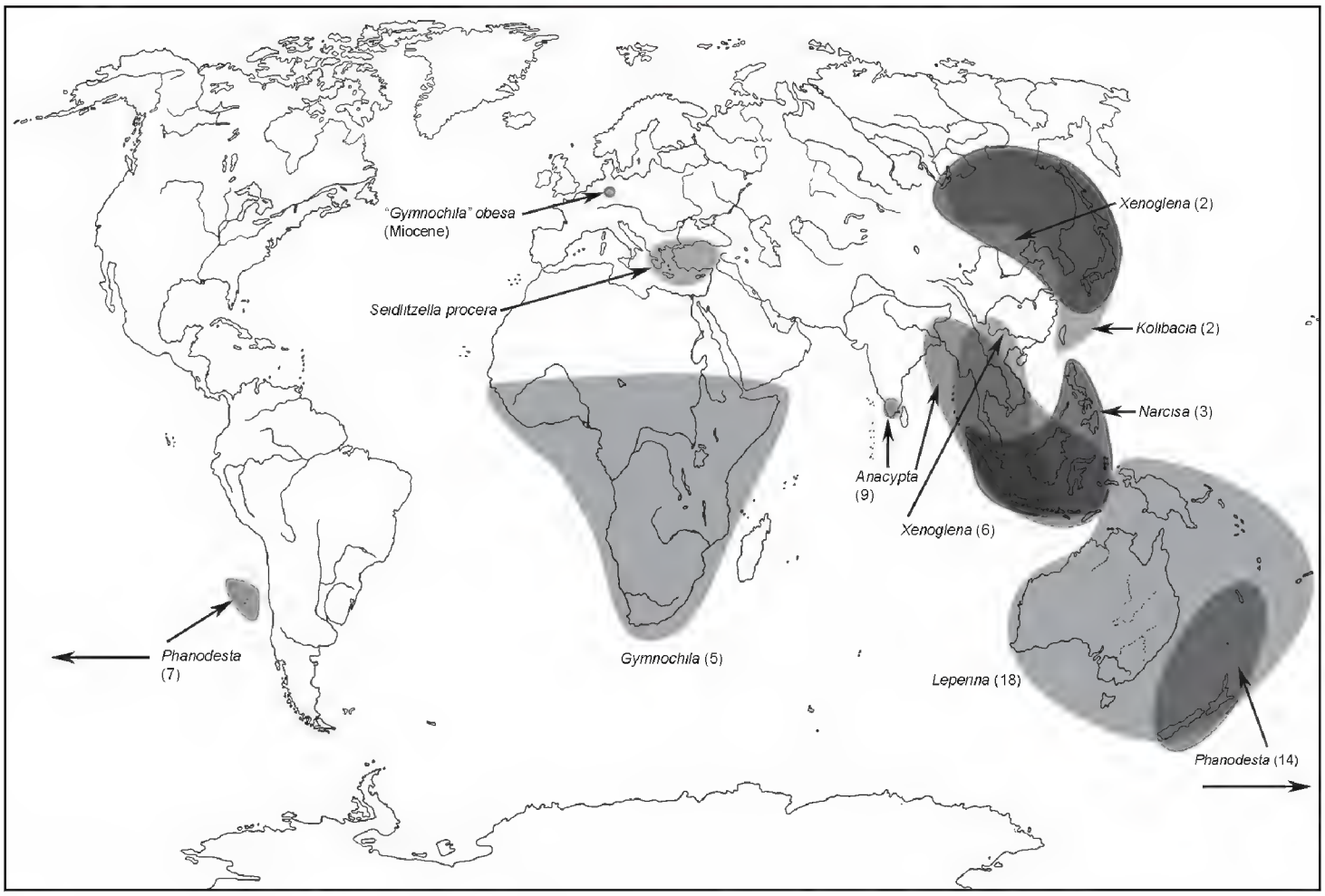


Figure 4. A *Anacypta* sp., Vietnam **B** *Anacypta punctata* **C** *Anacypta* sp., Laos **D** *Gymnocheilis subfasciata* **E** *Gymnocheilis* sp., Ghana **F** *Gymnocheilis varia* **G** *Kolibacia regularis* **H** *Kolibacia squamulata* **I** *Leperina cirrosa*.



Map 4. A distribution of the tribe Gymnochilini.

pers. comm.; experience from southern India) that some species can even jump(!) before they fly off.

Distribution. South-eastern Asia including Indonesia, Laos, Vietnam (numerous modern unpublished records). Often recorded together with species of *Xenoglena*.

Species:

birmanica Léveillé, 1888; Burma (AL)

Léveillé, A. 1910: 23 (*Acrops*)

cicatricosa Reitter, 1880; „Himalaya"(AL)

Léveillé, A. 1910: 23 (*Acrops*). Léveillé, A. 1910: 23 (*A. cicatricosa* var. *rugosa* Léveillé, 1899). Kolibáč, J. 2007a: 364 (syn. *Anacypta rugosa* Léveillé, 1899)

cyanea Léveillé, 1899; Perak (AL)

Léveillé, A. 1910: 23 (*Acrops*)

feai Léveillé, 1888; Tenasserim (AL)

Léveillé, A. 1910: 23 (*Acrops*)

gambeyi Léveillé, 1890; "Cochinchina" (AL)

Léveillé, A. 1910: 23 (*Acrops*)

higonia Lewis, 1888; Japan (AL, varA)

Léveillé, A. 1910: 23 (*Acrops*). Kolibáč, J. 2007a: 364. Nakane, T. et al. 1963: 181 (*Acrops*)

perraudierei Léveillé, 1905; Tonkin (AL)

Léveillé, A. 1910: 23 (*Acrops*)

punctata Fabricius, 1801; Sumatra, Moluccae, Borneo (AL)

Léveillé, A. 1910: 23

Léveillé, A. 1910: 23 (syn. *buprestoides* Weber, 1801); (Sumatra, Moluccae) (AL)
Léveillé, A. 1910: 23 (syn. *metallica* Dalman, 1824); (Borneo) (AL)
Léveillé, A. 1910: 23 (syn. *punctata* var. *dohrni* Reitter, 1876). Kolibáč, J. 2005: 44 (redescription)
weyersi Léveillé, 1900; Sumatra (AL)
Léveillé, A. 1910: 23 (*Acrops*)

Genus *Gymnocheilis* Dejean, 1835
http://species-id.net/wiki/Gymnocheilis
Figs 4, 13, 14; Map 4

Dejean, P. F. M. A.1835: 314

Type species. [Type species: *Peltis squamosa* Gray in Griffith and Pidgeon 1832; by monotypy]

Léveillé, A. 1910: 22 (*Gymnochila*). Kolibáč, J. 2005: 60 (*Gymnochila*, redescription). Kolibáč, J. 2006: 111 (*Gymnochila*, phylogeny). Reitter, E. 1876: 37 (*Gymnochila*). Leschen, R. A. B. & Lackner, T. 2013: 279, 289.

Lepidopteryx Hope, 1840 [Type species: *Peltis squamosa* Gray in Griffith and Pidgeon 1832; not *L. squamosa* Hope, 1840] See below for explanation of this synonymy.

Gymnochila Erichson, 1844 [Type species: *Trogosita vestita* Griffith, 1832 (= *Gymnochila varia* Fabricius, 1801); by monotypy]

Remarks. Yves Bousquet (pers. comm., 2010) kindly checked the nomenclatoral problem of *Leperina* that also bears upon the name of *Gymnocheilis*: *"... the type species of* Lepidopteryx *is* Trogosita squamosa *Gray, 1832 described from 'Melville's Island', not* Lepidopteryx squamosa *Hope, 1840. In his second and third catalogues, Dejean proposed the genus* Gymnocheilis *for* squamosa *Gray. So* Lepidopteryx *Hope, 1840 is a senior synonym of* Gymnochila *Erichson, 1844, which in turn is a junior synonym of* Gymnocheilis *Dejean, 1835."* The correct name *Gymnocheilis* has already been used by Leschen and Lackner (2013).

Description. Body size: about 9.0–14.0 mm. Body shape elongate. Gular sutures reduced. Frontoclypeal suture absent. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum of males: ctenidium present. Submentum: ctenidium present. Antennal groove present. Eyes: size large, dorsal. Eyes number: four. Epicranial acumination deep. Lacinial hooks absent. Galea: shape clavate. Galea: ciliate setae absent. Mediostipes-Lacinia fused together. Palpifer: outer edge denticulate. Mandibular apical teeth number: one. Mola present. Penicillus (at base) present (fine, often membranous). Pubescence above mola or cutting edge absent. Ventral furrow absent. Basal notch deep. Labrum-Cranium not fused. Epipharyngial sclerite present. Lateral tormal process: projection projection not developed (all remaining). Ligula: ciliate setae absent. Ligula rigid, not retroflexed, weakly emarginate. Hypopharyngeal sclerite absent. Antenna 11-segmented. Antennal club

asymmetrical, sensorial fields present. Front coxal cavities externally closed, internally open. Pronotum transverse. Prepectus absent. Middle coxal cavities closed. Elytra: long hairs absent. Epipleuron thin. Elytral interlocking mechanism present, carinae reduced. Elytral punctation regular, scales present. Wing: radial cell oblong (or reduced), wedge cell present, cross vein MP3-4 present, cross vein AA1+2-3+4 present. Front tibiae: spines along side moderate. Hooked spur present. Claws: denticle absent. Parasternites number along ventrites III–VII: one. Spiculum gastrale absent. Tegmen composed of three parts.

Biology. Probably predatory. Sometimes collected at light.

Distribution. Africa south of the equator.

Species:

lepidoptera Reitter, 1876; Abyssinia (AL)
Léveillé, A. 1910: 22. Reitter, E. 1876: 39

† *obesa* Heer, 1862; Germany: Öhningen; Tertiary: Middle Eocene (varA)
Ponomarenko, A. G. & Kireichuk, A. G. 2005–2008: http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm. Schmied, H. et al. 2009: 23

rugosa Thunberg, 1808; Guinea (AL)

sparsuta J. Thomson, 1858; Gabon (AL)
Léveillé, A. 1910: 22. (syn. *Gymnochila angulicollis* J. Thomson, 1858). Kolibáč, J. 2005: 60 (redescription). Reitter, E. 1876: 38

subfasciata J. Thomson, 1858; Gabon (AL)
Léveillé, A. 1910: 22. Reitter, E. 1876: 39

varia Fabricius, 1801; South Africa (AL)
Léveillé, A. 1910: 22 (syn. *Gymnochila adspersa* Boheman, 1848) (Caffraria)
Léveillé, A. 1910: 22 (syn. *Gymnochila laticollis* Boheman, 1848) (Caffraria)
Léveillé, A. 1910: 22 (syn. *Gymnochila squamosa* Gray in Griffith 1832) (Cap)
Léveillé, A. 1910: 22. (syn. *Gymnochila vestita* Fabricius, 1844) (Cap, South Africa)
Kolibáč, J. 2005: 60 (redescription). Reitter, E. 1876: 38

Genus *Kolibacia* Leschen & Lackner, 2013

http://species-id.net/wiki/Kolibacia
Fig. 4; Map 4

Leschen, R. A. B. & Lackner, T. 2013: 288.

Type species. *Leperina tibialis* Reitter, 1889 [designated by Leschen and Lackner 2013]
Schawaller, W. 1993: 4 (*Leperina* and *Seidlitzella*, Palaearctic species). Yoshitomi, H. & Lee, C.-F. (in press).

Description (according to Leschen and Lackner 2013). Body size: 7.2–9.1 mm. Colour of body black. Dorsal vestiture consisting of scales. Head extending beyond anterior angles of pronotum. Frons more or less horizontal with mandibles visible from above. Median lobe of clypeus absent. Edge of labrum straight. Eyes entire. Gena acute.

Supraocular scales present. Antenna 11-segmented with a loose club; lengths of antennomere II and III equal; antennomere XI circular, about as long as wide. Prothorax with lateral carinae unevenly crenulate; anterior angles projecting or acute; posterior angles angulate. Surface of pronotal disc even; punctation uniform and bearing scales. Procoxae visible in lateral view. Hypomeron bearing scales; anterior portion rugose. Length of elytra 4× as long as pronotum or even longer; seven elytral carinae present, not beaded and not rising significantly above surface of elytral disc; sublateral keel absent; intercarinal space bipunctate; window punctures present and simple; intercarinal scales never countersunk within punctures; lateral carina simple; epipleuron visible in lateral view. Hind wings present, fully developed; MP3 spur absent. Aedeagus (Kolibáč 2005) with parameres apically angulate; inner outline between parameres weakly sinuate or straight; length of parameres longer than base of tegmen. Protibial edge smooth, mucro absent; protibial spurs longer than tarsomere 2, anteriormost protibial spur greatly enlarged.

Larva (according to Kolibáč 2005): Frontal arms V-shaped. Epicranial stem reduced. Endocarina present. Mandibular apical teeth number: two, horizontally situated. Lacinia mandibulae with several small spines. Mola absent. Maxillary palpi 3-segmented. Mala: bidentate protrusion absent. Cardo: size much smaller than stipes. Ligula absent. Labial palpi 2-segmented. Prementum in single part. Antennal joints 1 and 2 elongate. Thoracic sclerites pattern (dorsally) 1-2-2. Abdominal segment IX not divided. Tergite IX flat. Urogomphi present, hooked; median process absent.

Biology. The adults and larvae are probably predatory. An adult *K. squamulata* was, for example, found in rotten birch (Schawaller 1993). Mamaev (1976) remarked that *K. squamulata* develops under bark and sometimes within the trunks of various deciduous trees infested with the larvae of *Melandrya*, *Tremex fuscicornis*, *Mesosa*, *Plagionotus* and others. On the other hand, Leschen and Lackner (2013) consider both species mycophagous, citing Kryzhanovskij (1965) and Nikitsky (1992). The former source is unknown to me, but the latter author considers *K. squamulata* predatory. However, *K. squamulata* differs from *Leperina* in the presence of the mandibular mola which is definitely a feature of mycophagous cleroids, although it may also be considered a primitive (rudimentary) character, a trait seen in similar fashion in certain *Gymnocheilis* species (see figures in Kolibáč 2005).

Distribution. Russian Far East, Mongolia, North Korea, North-eastern China, Japan: Hokkaido, Tsushima.

Species:

okinawana Yoshitomi & Lee (in press); Japan: Okinawa, Amami-Ôshima (AD)

Yoshitomi, H. & Lee, C.-F. (in press)

regularis Grouvelle, 1913; Taiwan, Vietnam (varA)

Grouvelle, A. 1913: 46 (*Leperina*). Yoshitomi, H. & Lee, C.-F. (in press; comb. *Kolibacia*, key)

squamulata Gebler, 1830 (*Peltis*); Russian Far East, Mongolia, North Korea, North-eastern China (varA, JK)

Léveillé, A. 1910: 22. Esaki, T. et al. 1951: 1061 (*L. squamulosa*). Kolibáč, J. 2006: 107 (*L. squamulosa*). Kolibáč, J. 2007a: 364. Löbl & Smetana 2010: 26

(*Lepidopteryx*). Mamaev, B. M. 1976: 1652 (larva, *Lepidopteryx*). Nakane, T. et al. 1963: 181 (*L. squamulosa*). Nikitsky, N. B. 1992: 81 (*L. squamulosa*). Leschen, R. A. B. & Lackner, T. 2013: 288. (comb. *Kolibacia*). Schawaller, W. 1993: 3 (key, *Leperina*). Yoshitomi, H. & Lee, C.-F. (in press; key)

tsushimana Nakane, 1985; Japan: Tsushima (varA)

Nakane, T. 1985: 162 (*Lepidopteryx squamulata tsushimana*). Kolibáč, J. 2009: 128 (*Lepidopteryx squamulata tsushimana*). Miyatake, M. 1985: 148 (*Leperina tsushimana*). Leschen, R. A. B. & Lackner, T. 2013: 288. (comb. *Kolibacia squamulata tsushimana*). Yoshitomi, H. & Lee, C.-F. (in press; *K. tsushimana*; key)

tibialis Reitter, 1889 (*Leperina*); Japan: Hokkaido (varA)

Léveillé, A. 1910: 22. Esaki, T. et al. 1951: 1061. Kolibáč, J. 2007a: 364. Löbl & Smetana 2010: 26 (*Lepidopteryx*). Nakane, T. et al. 1963: 181. Nikitsky, N. B. 1992: 81. Leschen, R. A. B. & Lackner, T. 2013: 288. (comb. *Kolibacia*). Yoshitomi, H. & Lee, C.-F. (in press; key)

Genus *Leperina* Erichson, 1844

http://species-id.net/wiki/Leperina

Figs 4, 5; Map 4

Erichson, W. F. 1844: 453.

Type species. *Trogosita decorata* Erichson, 1842 [designated by Kolibáč 2005]

Léveillé, A. 1910: 21. Crowson, R. A. 1964a: 299. Kolibáč, J. 2005: 65 (redescription). Kolibáč, J. 2006: 111 (phylogeny). Kolibáč, J. 2007a: 364. Kolibáč, J. 2009: 127 (*Lepidopteryx*). Leschen, R. A. B. & Lackner, T. 2013: 289. Matthews, E. G. 1992: 3 (key, *Lepidopteryx*). Reitter, E. 1876: 35.

Onyschomorpha Arrow, 1900 [Type species: *Onyschomorpha marmorata* Arrow, 1900; synonymized by Kolibáč, J. 2005: 65]

Léveillé, A. 1910: 23 (*Onyschomorpha*). Kolibáč, J. 2007a: 364 (*Onyschomorpha*, as a synonym)

Remarks. There has been a lack of clarity about the names *Leperina* and *Lepidopteryx* in the last decade or so. *Leperina* tended to be used by European authors while their overseas, mainly antipodean, colleagues preferred *Lepidopteryx*. I referred – correctly – to the genus as *Leperina* in 2005, 2006 and in *Catalogue of Palaearctic Beetles* edited by I. Löbl and A. Smetana (Kolibáč 2007a). Unfortunately, swayed by various sources, I mistakenly changed the name *Leperina* to *Lepidopteryx* in the Errata to Volume 4 of the "Catalogue" (Kolibáč 2009, Löbl and Smetana 2010).

Schawaller (1993: 2) considered *Lepidopteryx* a synonym of *Leperina* because of "*invalid description*" of the genus.

Most recently, Leschen and Lackner (2013: 289) justified the name *Leperina* in their review of the Pacific Gymnochilini thus: "[...] Gymnocheilis *Dejean, 1835 and*

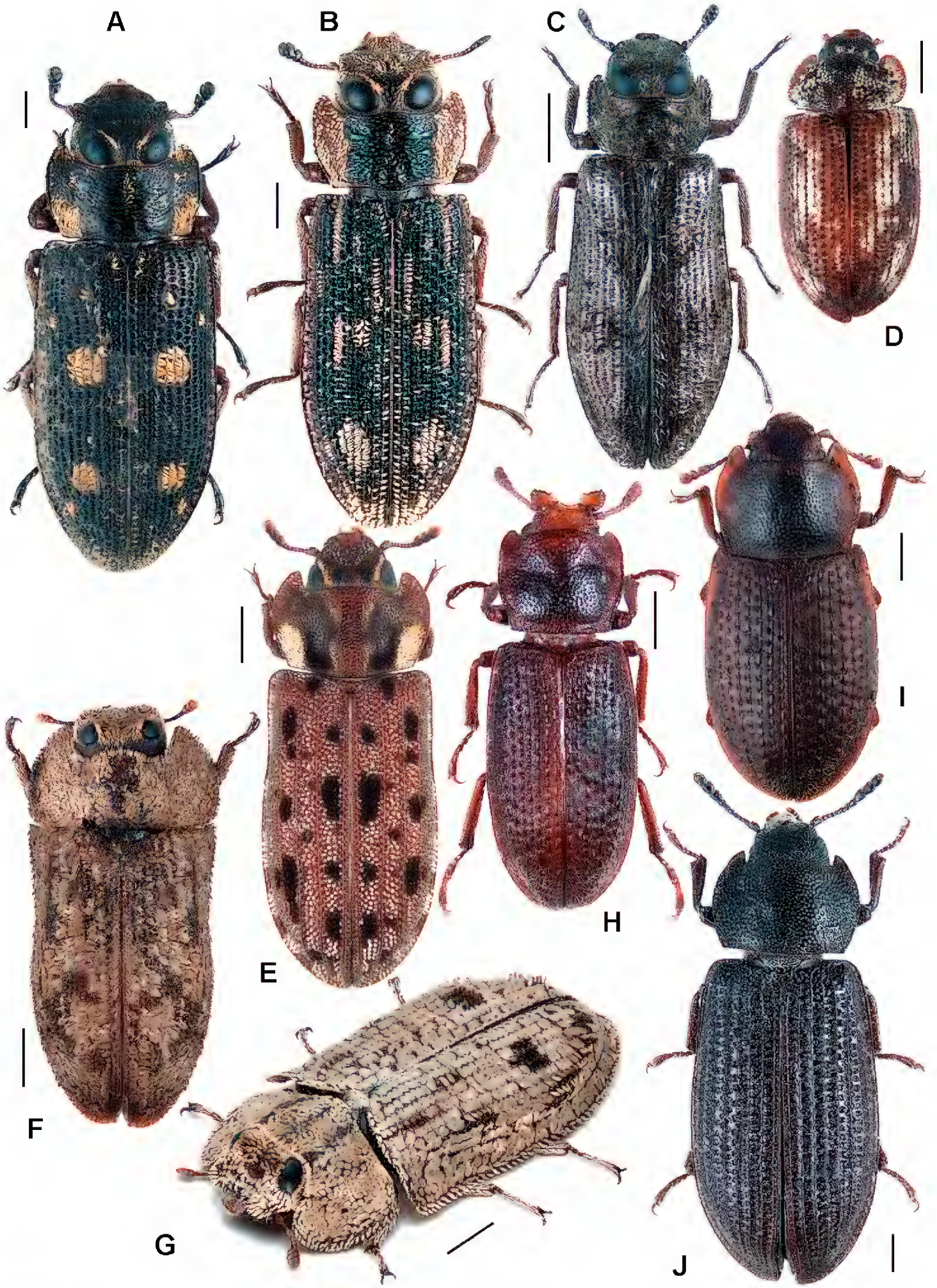


Figure 5. A *Xenoglena* sp.1, Vietnam **B** *Xenoglena* sp.2, Vietnam **C** *Xenoglena quadrisignata* (cf. *yunnanensis*) **D** *Leperina* (syn. *Onyschomorpha*) *marmorata* **E** *Leperina decorata* **F** *Narcisa decidua* **G** *Narcisa* sp., Seram **H** *Phanodesta cribraria*, "Chili" **I** *Phanodesta* sp., Juan Fernandez Isl. **J** *Seidlitzella procera*.

Lepidopteryx *Hope, 1840, are objective synonyms because they share type species (Dejean, 1835: 314 listed three species under his genus, but two are* nomina nuda*). The type species of* Lepidopteryx *and* Gymnocheilis *(*Trogosita squamosa *Gray in Griffith & Pidgeon, 1832 a synonym of* Trogosita varia *Fabricius, 1801: 151) was described from 'Melville's Island', but the figure of this species matches African species of* Gymnocheilis *Dejean with split-eyes and, therefore, the taxa contained within* Gymnocheilis *are not relevant phylogenetically to true* Leperina *nor* Phanodesta *(all with normal eyes).* Gymnocheilis *Dejean, 1835 has priority of the later name* Gymnochila *Erichson, 1844 [type species:* Trogosita vestita *Griffith, 1832, by monotypy, a synonym of* Gymnochila varia *(Fabricius, 1801) according to Léveillé, 1910: 22], although Reitter (1876: 37) placed* Lepidopteryx *as a synonym of* Gymnochila. *Note that White (1846) misspelled* Gymnocheilis *as* Gymnocheila *and wrongly attributed the name to Gray."*

Description (according to Leschen and Lackner 2013). Body size: 5.5–15.6 mm. Colour of body black and red-brown, unicolorous to multicoloured. Dorsal vestiture consisting of scales. Head extending beyond anterior angles of pronotum. Frons more or less horizontal with mandibles visible dorsally. Median lobe of clypeus absent. Edge of labrum weakly emarginate or straight. Eyes entire. Gena acute. Supraocular scales present or absent. Antenna 11-segmented with loose antennal club, lengths of antennomeres II and III equal or not; antennomere XI distinctly longer than wide and circular, about as long as wide. Prothorax with lateral carinae simple, weakly or unevenly crenulate; anterior angles projecting or acute; posterior angles of prothorax angulate. Pronotal surface generally uneven, punctation uniform or not with or without median glabrous areas; centre of disc usually bearing scales. Procoxae visible in lateral view. Hypomeron with or without scales, setose or glabrous; anterior portion rugose. Length of elytra 2.5–4× as long as pronotum or greater; disc with three simple carinae that are not beaded; sublateral keel absent; intercarinal space multipunctate; window punctures present and tuberculate; intercarinal scales of elytral disc variable, from very short and oval that may be countersunk within punctures to elongate with lengths at least 2.5× longer than wide; lateral carina simple; epipleuron hidden in lateral view. Hind wings present, fully developed; MP3 spur present (Kukalová-Peck and Lawrence 1993). Aedeagus (Kolibáč 2005) with parameres apically rounded to acute, inner outline between parameres bisinuate, weakly sinuate, or straight, length of parameres variable, median strut acute. Protibial edge spinate, mucro absent or weakly developed, spurs longer than tarsomere 2 with anteriormost spur greatly enlarged.

A description by Kolibáč (2005) based on *L. decorata*: Body shape elongate. Gular sutures wide, convergent at apex. Frontoclypeal suture absent. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides present. Submentum: ctenidium present. Antennal groove present. Eyes: size large, dorsal. Eyes number: two. Epicranial acumination deep. Lacinial hooks absent. Galea: shape clavate. Galea: ciliate setae absent. Mediostipes-Lacinia fused together. Palpifer: outer edge even. Mandibular apical teeth number: two, horizontally situated. Mola reduced but present. Penicillus (at base) present (fine, often membranous). Pubescence above mola or cutting edge absent. Ventral furrow absent. Basal notch shallow or absent. Labrum-

Cranium not fused. Epipharyngial sclerite present. Lateral tormal process: projection curved downwards, processes not connected (*Airora*). Ligula: ciliate setae absent. Ligula rigid, not retroflexed, weakly emarginate. Hypopharyngeal sclerite consisting of two separate parts. Antenna 11-segmented. Antennal club asymmetrical, sensorial fields present. Front coxal cavities externally closed, internally open. Pronotum transverse. Prepectus present. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron moderate. Elytral interlocking mechanism present, carinae conspicuous. Elytral punctation regular, scales present. Wing: radial cell triangular, wedge cell present, cross vein MP3-4 present, cross vein AA1+2-3+4 present. Front tibiae: spines along side moderate. Hooked spur present. Claws: denticle absent. Parasternites number along ventrites III–VII: two. Spiculum gastrale absent. Tegmen composed of three parts.

Biology. Both larva and adult are predatory. *L. decorata* and *L. monilata* were found in stems of *Eucalyptus obliqua*, where they were preying on larvae of *Epithora dorsalis* (Bashford 1994). The latter author notes a single-year life-cycle for the *Leperina* species (referred as *Lepidopteryx*). Adults have also been reared on *Acacia dealbata* (Bashford 1991).

Distribution. Australia incl. Tasmania, New Zealand, New Caledonia, New Guinea.

Species:

adusta Pascoe, 1860; Melbourne (AL)
Léveillé, A. 1910: 21

burnettensis MacLeay, 1871; Gayndah (AL)
Léveillé, A. 1910: 21

cincta Léveillé, 1889; New Zealand (AL)
Léveillé, A. 1910: 21

cirrosa Pascoe, 1860; Moreton Bay (AL)
Léveillé, A. 1910: 21. Hawkeswood, T. J. 1991: 159 (biology, *Lepidopteryx*).
Hawkeswood, T. J. 1992: 229 (biology, *Lepidopteryx*)

conspicua Olliff, 1885; Australia (AL)
Léveillé, A. 1910: 21

decorata Erichson, 1842; Tasmania (AL)
Léveillé, A. 1910: 21. Kolibáč, J. 2005: 65 (redescription)
Léveillé, A. 1910: 21 (syn. *Leperina gayndahensis* MacLeay, 1871); (Gayndah)

fraterna Olliff, 1885; Australia (AL)
Léveillé, A. 1910: 21

lacera Pascoe, 1860; Viti Isl. (AL)
Léveillé, A. 1910: 21. Léveillé, A. 1910: 21 (syn. *Leperina signoreti* Reitter, 1876).
Kukalová-Peck, J. & Lawrence, J. F. 1993: 243 (morphology of wing)

lichenea Fauvel, 1866; New Caledonia (AL)
Léveillé, A. 1910: 21

lifuana Fauvel, 1903; Lifu Isl. (AL)
Léveillé, A. 1910: 21

loriae Léveillé, 1893; New Guinea (AL)
Léveillé, A. 1910: 21

marmorata Arrow, 1900 (*Onyschomorpha*); Christmas Isl. (AL)
Léveillé, A. 1910: 23 (*Onyschomorpha* Arrow, 1900)
mastersi MacLeay, 1869; Gayndah (AL)
Léveillé, A. 1910: 21
monilata Pascoe, 1872 (= *moniliata* Blackburn, 1902); Australia (AL)
Léveillé, A. 1910: 22. Reitter, E. 1876: 31 (*Peltis*)
opatroides Léveillé, 1884; New Guinea (AL)
Léveillé, A. 1910: 22
seposita Olliff, 1885; Australia (AL)
Léveillé, A. 1910: 22
spercheoides Léveillé, 1878; New Caledonia (AL)
Léveillé, A. 1910: 22
turbata Pascoe, 1863; Australia (AL)
Léveillé, A. 1910: 22. Léveillé, A. 1910: 22 (syn. *Leperina fasciculata* Redtenbacher, 1868)

Genus *Narcisa* Pascoe, 1863

http://species-id.net/wiki/Narcisa
Fig. 5; Map 4

Pascoe, F. P. 1863: 28.

Type species. *Narcisa decidua* Pascoe, 1863 [by monotypy]
Léveillé, A. 1910: 23. Kolibáč, J. 2005: 69 (redescription). Kolibáč, J. 2006: 111 (phylogeny). Reitter, E. 1876: 43.

Remarks. The genus is apparently related to *Anacypta* and *Xenoglena*. The body is larger than in *Anacypta* but not so slender as in *Xenoglena*, moreover perfectly covered in scales. Further to the three species described, I have also encountered some undescribed species, all of them distributed in the Indonesian islands.

Description. Body size: about 7.0–9.0 mm. Body shape flat. Gular sutures narrow, subparallel at apex. Frontoclypeal suture absent. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum: ctenidium present. Antennal groove present. Eyes: size large, dorsal. Eyes number: four. Epicranial acumination absent. Lacinial hooks absent. Galea: shape clavate. Galea: ciliate setae absent. Mediostipes-Lacinia fused together. Palpifer: outer edge even. Mandibular apical teeth number: two, vertically situated. Mola absent. Penicillus (at base) long setae. Pubescence above mola or cutting edge absent. Ventral furrow absent. Basal notch shallow or absent. Labrum-Cranium not fused. Epipharyngial sclerite present. Lateral tormal process: projection curved downwards, processes not connected (*Airora*). Ligula: ciliate setae absent. Ligula rigid, not retroflexed, weakly emarginate. Hypopharyngeal sclerite absent. Antenna 11-segmented. Antennal club asymmetrical, sensorial fields present. Front coxal cavities externally closed, internally

open. Pronotum transverse. Prepectus absent. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron moderate. Elytral interlocking mechanism present, carinae reduced. Elytral punctation regular, scales present. Wing: radial cell oblong (or reduced), wedge cell present, cross vein MP3-4 present, cross vein AA1+2-3+4 present. Front tibiae: spines along side reduced. Hooked spur present. Claws: denticle absent. Parasternites number along ventrites III–VII: one. Spiculum gastrale absent. Tegmen composed of three parts.

Biology. Unknown, probably predatory like *Anacypta*.

Distribution. Indonesia (species that remain formally undescribed are known from Sulawesi and other islands).

Species:

bimaculata Gestro, 1879; Sumatra (AL)

Léveillé, A. 1910: 23

decidua Pascoe, 1863; Batchian (AL)

Léveillé, A. 1910: 23. Kolibáč, J. 2005: 69 (redescription). Reitter, E. 1876: 43

lynceus Olliff, 1883; Borneo (AL)

Léveillé, A. 1910: 23

Genus *Phanodesta* Reitter, 1876

http://species-id.net/wiki/Phanodesta

Fig. 5; Map 4

Reitter, E. 1876: 31.

Type species. *Phanodesta cordaticollis* Reitter, 1876 [designated by Kolibáč 2005]

Léveillé, A. 1910: 20. Crowson, R. A. 1964a: 299. Kolibáč, J. 2005: 77 (redescription). Kolibáč, J. 2006: 111 (phylogeny). Leschen, R. A. B. & Lackner, T. 2013: 290.

Remarks. As mentioned previously, six *Phanodesta* species from Juan Fernandez Island have been considered peculiar wingless beetles, with a form of elytral sculpture that is unknown in other trogossitids. Two analyses have shown a relationship for the genus within Gymnochilini, perhaps as a strongly-derived descendent of Australian *Leperina* (Kolibáč 2006, 2008). Most recently, Leschen and Lackner (2013) revised and redescribed the genus, established several new species from New Zealand, and combined some *Leperina* with *Phanodesta* species. They also discovered an uncommon distribution pattern comprising New Zealand (and adjacent islands) and Juan Fernandez Island.

Description (according to Leschen and Lackner 2013). Body size: 5.4–11.5 mm. Colour of body black or red-brown. Dorsal vestiture consisting of setae, scales or both. Head extending beyond anterior angles of pronotum. Frons more or less horizontal with mandibles visible in dorsal view. Median lobe of clypeus absent. Edge of labrum weakly to strongly emarginate or straight. Eyes entire. Gena acute. Supra-ocular scales present or absent. Antenna 11-segmented with loose club; rela-

tive lengths antennomeres II and III variable; antennomere XI distinctly longer than wide and circular, about as long as wide or shorter. Prothorax with lateral carinae simple, or weakly to strongly and evenly or unevenly crenulate; anterior angles projecting or acute; posterior angles angulate. Pronotal surface even or uneven with impressions or shallow grooves; punctation uniform or not, with or without median area glabrous. Procoxae visible in lateral view. Hypomeron setose, glabrous, or bearing scales; anterior portion of hypomeron weakly to strongly rugose. Length of elytra 2.5–4× or less than 2.5× as long as pronotum; carinae present and usually beaded, with punctures located centrally within it, or adjacent and contacting carina; number of carinae variable, but usually 7–9; sublateral keel absent or present; intercarinal space apunctate; window punctures absent; intercarinal scales of disc never countersunk within puncture, elongate with lengths 2.5× longer than wide or ovate to circular with lengths less than 2.5× longer than wide; scales erect or not overlapping to strongly overlapping and adpressed; lateral carina simple; epipleuron visible or hidden in lateral view. Hind wings present and fully developed with MP3 spur present or vestigial and in the form of small buds, or absent. Aedeagus with parameres apically angulate, rounded or acute; inner outline between parameres bisinuate, weakly sinuate or straight; length of parameres and shape of median strut variable. Protibial edge smooth or crenulate; mucro absent or weakly developed; spurs longer than tarsomere 2 with anteriormost protibial spur greatly enlarged. Bursa and spermatheca bulbous, spermatheca about one fifth the size of the bursa and bearing a small tubulate spermathecal gland.

A description by Kolibáč (2005) based on *P. cribraria*: Body shape elongate. Gular sutures reduced. Frontoclypeal suture absent. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides present. Submentum: ctenidium absent. Antennal groove present. Eyes: size flat. Eyes number: two. Epicranial acumination deep. Lacinial hooks absent. Galea: shape clavate. Galea: ciliate setae absent. Mediostipes-Lacinia fused together. Palpifer: outer edge even. Mandibular apical teeth number: two, vertically situated. Mola reduced but present. Penicillus (at base) present (fine, often membranous). Pubescence above mola or cutting edge absent. Ventral furrow ciliate. Basal notch shallow or absent. Labrum-Cranium not fused. Epipharyngial sclerite present. Lateral tormal process: projection curved downwards, processes not connected (*Airora*). Ligula: ciliate setae absent. Ligula rigid, strongly retroflexed, weakly emarginate. Hypopharyngeal sclerite absent. Antenna 11-segmented. Antennal club asymmetrical, sensorial fields present. Front coxal cavities externally closed, internally open. Pronotum transverse. Prepectus absent. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron moderate. Elytral interlocking mechanism present, carinae reduced. Elytral punctation regular, scales absent. Wings – present or absent. Front tibiae: spines along side moderate. Hooked spur present. Claws: denticle absent. Parasternites number along ventrites III–VII: two. Spiculum gastrale absent. Coxitae divided.

Biology. Probably predatory. Adults may be collected at night on fungi and on the trunks of dead, dying and live trees, or on the ground (Leschen and Lackner 2013).

Larvae of *Phanodesta* have been found in association with adults and are thought to be predatory beneath the bark of dead trees (Klimaszewski and Watt 1997). *Phanodesta nigrosparsa* is restricted to the *Phyllocladus trichomanoides* and *Agathis australis* trees, while *P. brounii* is a generalist (Kuschel 1990).

Distribution. Chile: Juan Fernandez Island; New Caledonia, New Zealand mainland and offshore islands, Lord Howe Island.

Species:

argentea Montrouzier, 1860 (*Nitidula*); New Caledonia (AL)
Léveillé, A. 1910: 21 (*Leperina*). Leschen, R. A. B. & Lackner, T. 2013: 300 (comb. from *Leperina*; maybe conspecific with *L. spercheoides*)

brevipennis Reitter, 1876; Chile: Juan Fernandez Island (AL)
Léveillé, A. 1910: 20. Reitter, E. 1876: 33. Leschen, R. A. B. & Lackner, T. 2013: 300

brounii Pascoe, 1880; New Zealand (AL)
Léveillé, A. 1910: 21 (*Leperina*). Leschen, R. A. B. & Lackner, T. 2013: 291 (comb. from *Leperina*)

carinata Leschen & Lackner, 2013; New Zealand (AD)
Leschen, R. A. B. & Lackner, T. 2013: 292

cribraria Blanchard, 1851 (*Toxicum*); Chile: Juan Fernandez Island (AL)
Léveillé, A. 1910: 20 (syn. *Phanodesta cordaticollis* Reitter, 1876). Léveillé, A. 1910: 21 (syn. *Phanodesta picea* Germain, 1855). Kolibáč, J. 2005: 77 (redescription). Leschen, R. A. B. & Lackner, T. 2013: 300. Reitter, E. 1876: 32 (*Phanodesta cordaticollis* Reitter, 1876)

cribrata Germain, 1855; Chile: Juan Fernandez Island (AL)
Léveillé, A. 1910: 21 (syn. *Phanodesta angulata* Reitter, 1876). Leschen, R. A. B. & Lackner, T. 2013: 300. Reitter, E. 1876: 33 (*P. angulata*)

francoisi Léveillé, 1909; New Caledonia (AL)
Léveillé, A. 1910: 21 (*Leperina*). Leschen, R. A. B. & Lackner, T. 2013: 300 (comb. from *Leperina*; combination based on an image of the type)

guerini Montrouzier, 1860 (*Nitidula*); New Caledonia (AL)
Léveillé, A. 1910: 21 (*Leperina*). Leschen, R. A. B. & Lackner, T. 2013: 300 (comb. from *Leperina*). Reitter, E. 1876: 35 (*Phanodesta*)

iohowi Germain, 1898; Chile: Juan Fernandez Island (AL)
Léveillé, A. 1910: 21 (*P. johowi*). Leschen, R. A. B. & Lackner, T. 2013: 300

manawatawhi Leschen & Lackner, 2013; New Zealand (AD)
Leschen, R. A. B. & Lackner, T. 2013: 293

oculata Leschen & Lackner, 2013; New Zealand (AD)
Leschen, R. A. B. & Lackner, T. 2013: 295

nigrosparsa White, 1846 (*Gymnocheila*); New Zealand (AL)
Léveillé, A. 1910: 22 (*Leperina*). Klimaszewski, J. & Watt, J. C. 1997: 43 (*Lepidopteryx*). Leschen, R. A. B. & Lackner, T. 2013: 294 (comb. from *Leperina*). Reitter, E. 1876: 35 (*Phanodesta*)

pubescens Germain, 1898; Chile: Juan Fernandez Island (AL)
Léveillé, A. 1910: 21. Leschen, R. A. B. & Lackner, T. 2013: 300

pudica Olliff, 1889 (*Ostoma*); Lord Howe Island (varA)
Léveillé, A. 1910: 32 (*Ostoma incertae sedis)*. Leschen, R. A. B. & Lackner, T. 2013: 299 (comb. from *Ostoma*)
robusta Pic, 1924; Chile: Juan Fernandez Island (varA)
Pic, M. 1924: 378
shandi Broun, 1909; New Zealand (varA)
Broun, 1909: 307 (*Leperina*). Leschen, R. A. B. & Lackner, T. 2013: 296 (comb. from *Leperina*)
signoreti Montrouzier, 1860 (*Leperina*); New Caledonia (AL)
Léveillé, A. 1910: 22 (*Leperina*). Leschen, R. A. B. & Lackner, T. 2013: 300 (comb. from *Leperina*)
sobrina White, 1846 (*Gymnocheila*); New Zealand (AL)
Léveillé, A. 1910: 22 (*Leperina*). Brookes, A. 1932: 28 (*Leperina interrupta*; syn. by Leschen, R. A. B. & Lackner, T. 2013: 296). Léveillé, A. 1910: 22 (syn. *Leperina fasciolata* Blanchard, 1853). Léveillé, A. 1910: 22 (syn. *Leperina nigro-sparsa* Blanchard, 1853; homonym with *L. nigrosparsa* White, 1846). Leschen, R. A. B. & Lackner, T. 2013: 296 (comb. from *Leperina*). Reitter, 1876: 35 (*Phanodesta*). Sharp, 1877: 266 (*Leperina farinosa*; syn. by Leschen, R. A. B. & Lackner, T. 2013: 296)
tepaki Leschen & Lackner, 2013; New Zealand (AD)
Leschen, R. A. B. & Lackner, T. 2013: 297
variegata Germain, 1855; Chile: Juan Fernandez Island (AL)
Léveillé, A. 1910: 21. Léveillé, A. 1910: 21. (syn. *Phanodesta costipennis* Reitter, 1876). Leschen, R. A. B. & Lackner, T. 2013: 300. Reitter, E. 1876: 34 (*P. costipennis*)
wakefieldi Sharp, 1877 (*Leperina*); New Zealand (AL)
Léveillé, A. 1910: 22 (*Leperina*). Leschen, R. A. B. & Lackner, T. 2013: 298 (comb. from *Leperina*)

Genus *Seidlitzella* Jakobson, 1915

http://species-id.net/wiki/Seidlitzella
Fig. 5; Map 4

Jakobson, G. G. 1915: 893.

Type species. *Peltis procera* Kraatz, 1858 [by monotypy]
Kolibáč, J. 2005: 82 (redescription). Kolibáč, J. 2006: 111 (phylogeny). Kolibáč, J. 2007a: 365. Schawaller, W. 1993: 2 (synonymized with *Leperina*). Leschen, R. A. B. & Lackner, T. 2013: 279, 289.
Cymba Seidlitz, 1875 (homonym) [type species: *Peltis procera* Kraatz, 1858; by original designation and monotypy]
Léveillé, A. 1910: 20. Kolibáč, J. 2007a: 365. Reitter, E. 1876: 30. Schawaller, W. 1993: 2.

Peltocymba Reitter, 1920 [type species: *Peltis procera* Kraatz, 1858; by original designation and monotypy]

Kolibáč, J. 2007a: 365. Schawaller, W. 1993: 2.

Remarks. Schawaller (1993) synonymized *Seidlitzella* with *Leperina*. However, he based his observations on a comparison between *Seidlitzella procera* and two Palaearctic *Leperina* species, *L. squamosa* and *L. tibialis*. Australian species are often very different, although some their morphological details may also be similar (*L. decorata* is the type species of *Leperina*). Recently, Leschen and Lackner (2013) have established the new genus *Kolibacia* for the Palaearctic *Leperina squamosa* and *L. tibialis*. However, as their paper centred chiefly on *Phanodesta*, a differential diagnosis between *Seidlitzella* and *Kolibacia* was not addressed in detail. The main differences are explained in "A key to the species" of Gymnochilini, below.

Descripton. Body size: 11.0–19.0 mm. Body shape elongate. Gular sutures wide, convergent at apex. Frontoclypeal suture absent. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides present. Submentum of males: ctenidium present. Antennal groove present. Eyes: size flat. Eyes number: two. Epicranial acumination moderate. Lacinial hooks absent. Galea: shape clavate. Galea: ciliate setae absent. Mediostipes-Lacinia not fused. Palpifer: outer edge denticulate. Mandibular apical teeth number: two, vertically situated. Mola absent. Penicillus (at base) present (fine, often membranous). Pubescence above mola or cutting edge absent. Ventral furrow absent. Basal notch shallow or absent. Labrum-Cranium not fused. Epipharyngial sclerite present. Lateral tormal process: projection curved downwards, processes not connected (*Airora*). Ligula: ciliate setae absent. Ligula rigid, weakly retroflexed, weakly emarginate. Hypopharyngeal sclerite absent. Antenna 11-segmented. Antennal club asymmetrical, sensorial fields present. Front coxal cavities externally closed, internally open. Pronotum transverse. Prepectus absent. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron moderate. Elytral interlocking mechanism present, carinae conspicuous. Elytral punctation regular, scales absent. Wing: radial cell oblong (or reduced), wedge cell present or absent, cross vein MP3-4 present, cross vein AA1+2-3+4 absent. Front tibiae: spines along side moderate. Hooked spur present. Claws: denticle absent. Parasternites number along ventrites III–VII: one. Spiculum gastrale absent. Tegmen composed of two parts. Coxitae undivided.

Biology. Predatory. Adults found on logs of various trees (e.g. the fir *Abies cilicia*), larvae found under pine bark (Schawaller 1993).

Distribution. Greece, Cyprus, Turkey.

Species:

procera Kraatz, 1858; Greece, Cyprus, Turkey (JK)

Léveillé, A. 1910: 20 (*Cymba*). Kolibáč, J. 2005: 82 (redescription). Kolibáč, J. 2007a: 365. Reitter, E. 1876: 31 (*Cymba*). Schawaller, W. 1993: 4 (larva)

Genus *Xenoglena* Reitter, 1876
http://species-id.net/wiki/Xenoglena
Fig. 5; Map 4

Reitter, E. 1876: 40.

Type species. *Xenoglena deyrollei* Reitter, 1876 [by monotypy]

Léveillé, A. 1910: 23. Kolibáč, J. 2005: 85 (redescription). Kolibáč, J. 2006: 111 (phylogeny). Kolibáč, J. 2007a: 364. Nikitsky, N. B. 1992: 81.

Remarks. Outer habitus resembles the jewel beetles (Buprestidae), especially those of the genus *Chrysobothris*. *Anacypta asahinai* Kono, 1938 was combined with *Xenoglena* by Kolibáč (2009). The combination is in accord with the opinion of Nikitsky (1992) and also my own independent study of the species. Nikitsky (*l.c.*) moreover suggested its synonymization with *Xenoglena quadrisignata.*

Description. Body size: about 7.0–10.0 mm. Body shape elongate. Gular sutures narrow, subparallel at apex. Frontoclypeal suture absent. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum: ctenidium present. Antennal groove present. Eyes: size large, dorsal. Eyes number: four. Epicranial acumination absent. Lacinial hooks absent. Galea: shape clavate. Galea: ciliate setae absent. Mediostipes-Lacinia fused together. Palpifer: outer edge even. Mandibular apical teeth number: two, vertically situated. Mola reduced but present. Penicillus (at base) long setae. Pubescence above mola or cutting edge absent. Ventral furrow absent. Basal notch shallow or absent. Labrum-Cranium not fused. Epipharyngial sclerite present. Lateral tormal process: projection curved downwards, processes not connected (*Airora*). Ligula: ciliate setae absent. Ligula rigid, not retroflexed, weakly emarginate. Hypopharyngeal sclerite absent. Antenna 11-segmented. Antennal club asymmetrical, sensorial fields present. Front coxal cavities externally closed, internally open. Pronotum transverse. Prepectus absent. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron thin. Elytral interlocking mechanism present, carinae reduced. Elytral punctation regular, scales present. Wing: radial cell oblong (or reduced), wedge cell absent, cross vein MP3-4 present, cross vein AA1+2-3+4 absent. Front tibiae: spines along side reduced. Hooked spur present. Claws: denticle absent. Parasternites number along ventrites III–VII: one. Spiculum gastrale absent. Coxitae undivided.

Biology. Predatory. Adults dwell on fallen trees and dry branches, hunting for xylophagous insects. They fly and run at great speed and appear very like some jewel beetles in body shape.

Distribution. Indonesia, Malayan Peninsula, Russian Far East, Japan, northern China. A large body of material of perhaps-undescribed species is known to me from northern Laos.

Species:

asahinai Kono, 1938: 227 (*Acrops*); Japan (varA)

Nakane, T. et al. 1963: 181 (*Acrops*). Kolibáč, J. 2009: 128 (comb. with *Xenoglena*)

Note: maybe synonym of *X. quadrisignata*; opinion by Nikitsky 1992: 81

chrysobothroides Léveillé, 1897; Malacca (AL)
Léveillé, A. 1910: 23
deyrollei Reitter, 1876; Java (AL)
Léveillé, A. 1910: 23. Kolibáč, J. 2005: 87 (redescription). Reitter, E. 1876: 41
fryi Léveillé, 1899; Perak (AL)
Léveillé, A. 1910: 23
quadrisignata Mannerheim, 1852; Siberia, Mongolia, Far East, Japan, North Korea, China: Northeast Territory (varA)
Léveillé, A. 1910: 22 (*Gymnochila*). Kolibáč, J. 2005: 86 (redescription). Kolibáč, J. 2007a: 364. Nikitsky, N. B. 1992: 81. Reitter, E. 1876: 40 (*Gymnochila*)
tetrasigma Léveillé, 1878; Malacca (AL)
Léveillé, A. 1910: 23
vicina Léveillé, 1897; Malacca (AL)
Léveillé, A. 1910: 23
yunnanensis Léveillé, 1907; China: Yunnan (AL)
Léveillé, A. 1910: 23. Kolibáč, J. 2007a: 364

Tribe Trogossitini Latreille, 1802

Latreille, P. A. 1802: 110.

Type genus: *Trogossita* Olivier, 1790 (= *Temnoscheila* Westwood, 1830)
Burakowski, B. et al. 1986: 115 (Nemosomatinae). Kolibáč, J. 2006: 120 (diagnosis, stat. n.). Kolibáč, J. 2007a: 364 (phylogeny). Kolibáč, J. 2008: 118–119 (phylogeny).

Remarks. Two character analyses of Trogossitini (Kolibáč 2006, 2008) separate off a monophyletic group composed of the genera *Temnoscheila*, *Nemozoma*, *Tenebroides*, *Corticotomus*, and *Leipaspis*. The other two genera analyzed, *Airora* and *Alindria*, are more primitive. Their position in the cladogram of 2008 (p. 119) makes Trogossitini paraphyletic with reference to Gymnochilini but the original analysis (2006) unambiguously set the two groups appart as distinct monophyletic clades. A classification of *Seidlitzella* has been discussed above, in the "Remarks" section of the Gymnochilini entry.

There are also some genera that are not included in the two character analyses because of insufficient data sets, namely *Dupontiella*, *Elestora*, *Eupycnus*, *Euschaefferia*, and *Parallelodera*. The classification of all these rather advanced genera within Trogossitini is undeniable, apart from the monotypic *Elestora* which is obviously related to *Melambia*, for which the systematics are quite complicated and in need of revision.

Most of the members of Trogossitini lead the kind of life typical of predatory Cleridae, especially of the subfamilies Clerinae and Tillinae. Adults hunt for xylophagous insects (e.g. Curculionidae: Scolytinae, Bostrichidae) on branches and logs while larvae dwell and hunt under bark or in galleries. However, some trogossitine adults live in insect galleries together with their larvae (e.g. *Nemozoma*). The trogossitins are not as efficient in the air as the gymnochilins, and neither do they move so swiftly on the ground.

Key to the recent genera

1 Frons with conspicuous sharp longitudinal groove **2**
– Frons without groove, with shallow depression at most **3**
2 Anterior part of cranium (frons) with two large horn-like processes; body extremely elongate, small (about 3–6 mm) ..... ***Nemozoma***
– Anterior part of cranium (frons) without distinct processes; body not extremely elongate, larger (about 7–25 mm) ..... ***Temnoscheila***
3 Pronotum conspicuously elongate, weakly narrowed at base; body elongate and cylindrical **4**
– Pronotum transverse or quadrate or narrowed at base; elytra widest in apical third and somewhat flattened **8**
4 Pronotum somewhat cordate; elytra with carinae; large species (about 10–35 mm) ..... ***Alindria***
– Sides of pronotum nearly parallel; elytra without carinae; smaller species (about 2–15 mm) **5**
5 Outer margins of all tibiae with large spines; antennae reach backwards anterior margin of pronotum; larger species (about 7–15 mm) ..... ***Airora***
– Outer margin of tibiae with 2–3 spines at apex at most; antennae reach back to beyond anterior margin of pronotum; smaller species (about 2–5 mm) .. **6**
6 Pronotum conspicuously narrowed (constricted) at base ..... ***Dupontiella***
– Pronotum not narrowed at base, oblong **7**
7 Pronotum with distinctly raised lateral margins; submentum distinctly separated from gula in front, outer angles not prominent; at least front tibiae with spines at apex ..... ***Corticotomus***
– Pronotum without distinctly raised lateral margins, apical angles obliterated; submentum not distinctly separated from gula in front, outer angles prominent and produced apically at least to base of mandibles; tibiae without spines ..... ***Euschaefferia***
8 Elytra with conspicuous carinae and regular punctation **9**
– Elytra without carinae, with regular sculpture only **10**
9 Dorsal body surface distinctly flattened; very wide, black species, elytra with four striking orange spots; mesonotum with long orange hairs ..... ***Elestora***
– Dorsal body surface not distinctly flattened, almost cylindrical; elongate, almost cylindrical, unicolorous (black or brown) species without colour pattern ..... ***Melambia***
10 Body including head and pronotum distinctly elongate; pronotum constricted at base ..... ***Leipaspis***
– Body not so elongate; sides of pronotum subparallel or cordate **11**
11 Tarsal pattern 4-4-4: 1st tarsomere coalescent with 2nd tarsomere in all pairs of legs; elytra rather convex ..... ***Parallelodera***
– Tarsal pattern 5-5-5; elytra rather flattened **12**

12 All tibiae with about 3-6 conspicuous spines along outer margin; pronotum subparallel, elongate; labrum retracted, hardly visible; body more coarsely sculptured ..... ***Eupycnus***

– All tibiae with about 2–4 spines along outer margin; pronotum cordate, approximately as long as wide; labrum distinctly visible; body sculpture finer... ..... ***Tenebroides***

Genus *Airora* Reitter, 1876
http://species-id.net/wiki/Airora
Figs 1, 6; Map 5

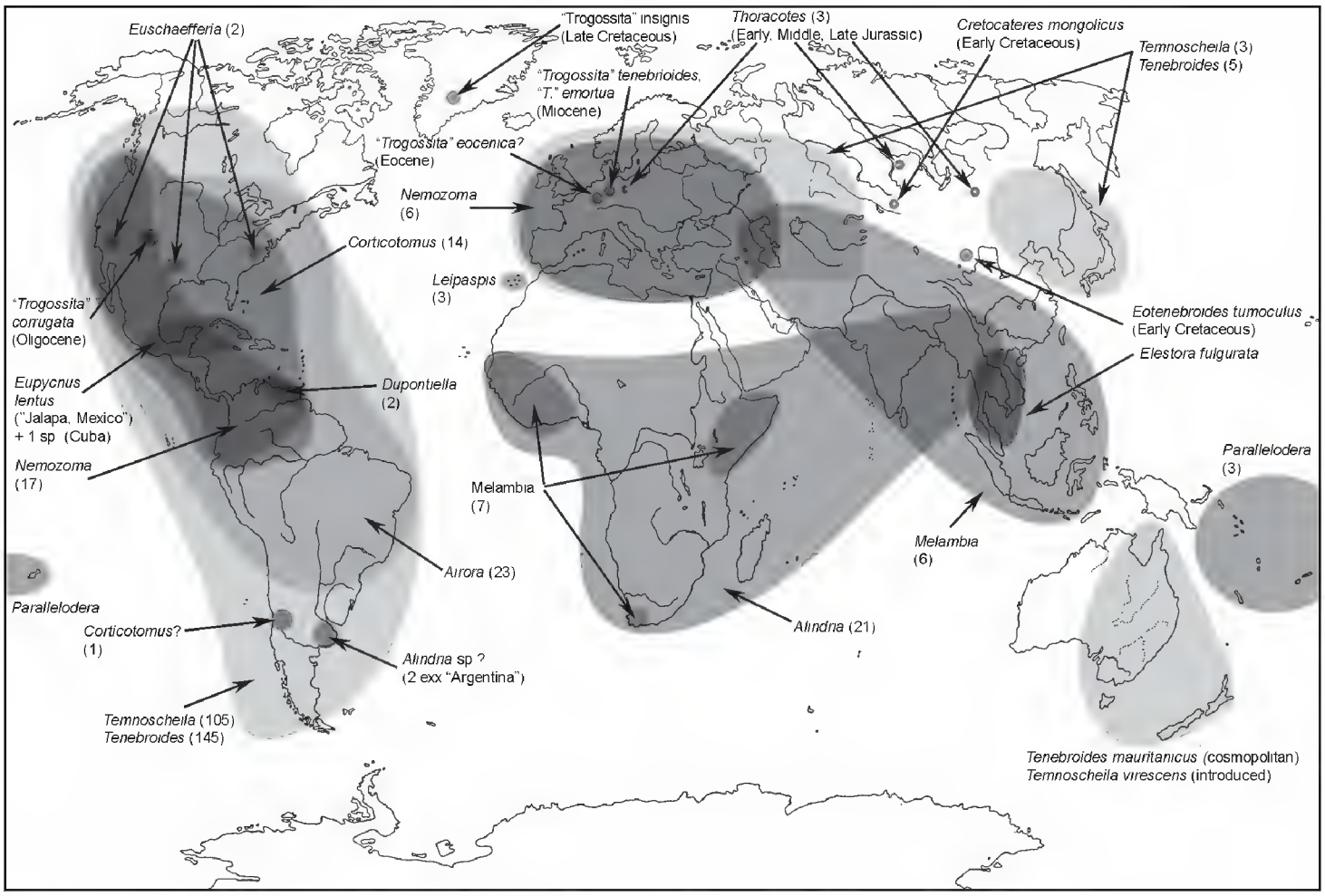
Reitter, E. 1876: 18.

Type species. *Trogossita cylindrica* Serville, 1828 [designated by Barron 1971]
Léveillé, A. 1910: 7. Barron, J. R. 1971: 64. Kolibáč, J. 2005: 41 (redescription). Kolibáč, J. 2006: 111 (phylogeny).
Temnochilodes Léveillé, 1890 [type species: *Temnochilodes dugesi* Léveillé, 1890]
Léveillé, A. 1910: 9. Kolibáč, J. 2005: 41 (synonymized)

Description. Body size: about 7.0–16.0 mm. Body shape elongate. Gular sutures narrow, subparallel at apex. Frontoclypeal suture absent. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides present. Submentum: ctenidium absent. Antennal groove present. Eyes: size flat. Eyes number: two. Epicranial acumination deep. Lacinial hooks absent. Galea: shape elongate. Galea: ciliate setae absent. Mediostipes-Lacinia not fused. Palpifer: outer edge denticulate. Mandibular apical teeth number: two, vertically situated. Mola reduced but present. Penicillus (at base) present (fine, often membranous). Pubescence above mola or cutting edge absent. Ventral furrow present. Basal notch moderate. Labrum-Cranium not fused. Epipharyngial sclerite present. Lateral tormal process: projection curved downwards, processes not connected (*Airora*). Ligula: ciliate setae absent. Ligula rigid, strongly retroflexed, deeply emarginate. Hypopharyngeal sclerite consisting of two separate parts. Antenna 11-segmented. Antennal club asymmetrical, sensorial fields present. Front coxal cavities externally closed, internally open. Pronotum elongate. Prepectus absent. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron moderate. Elytral interlocking mechanism present, carinae reduced. Elytral punctation regular, scales absent. Wing: radial cell oblong (or reduced), wedge cell present, cross vein MP3-4 present, cross vein AA1+2-3+4 absent. Front tibiae: spines along side large. Hooked spur present. Claws: denticle absent. Parasternites number along ventrites III–VII: one. Spiculum gastrale absent. Tegmen composed of two parts. Coxitae undivided.

Larva: Frontal arms V-shaped. Epicranial stem reduced. Endocarina present. Gular sutures conspicuous, parallel. Gula: anterior apodemes absent. Paragular sclerites present. Hypostomal rods absent. Stemmata number: five. Mandibular apical teeth number: two,

Figure 6. A *Alindria spectabilis* **B** *Alindria elongata* **C** *Alindria* sp., Thailand **D** *Airora cylindrica* **E** *Airora* (syn. *Temnochilodes*) *dugesi* **F** *Corticotomus* (syn. *Colydobius*) *divisus* **G** *Elestora fulgurata*.



Map 5. A distribution of the tribe Trogossitini.

horizontally situated. Lacinia mandibulae absent. Mola absent. Maxillary palpi 3-segmented. Cardo: size much smaller than stipes. Labial palpi 2-segmented. Prementum in single part. Antennal joints 1 and 2 elongate. Sensory appendix very small. Thoracic sclerites pattern (dorsally) 1-2-2. Thoracic sclerites pattern (ventrally) 3+1+1. Abdominal segment IX not divided. Tergite IX flat. Urogomphi present, hooked; median process absent.

Biology. Predatory. In USA, adults dwell mostly on branches and logs of various species of pine. Some specimens were also collected from the bush *Cercidium correyanum* and some emerged from the fungus *Fomes applanatus*. *Airora minuta* adults were observed preying on the bark beetle *Hylocurus*. (All Barron 1971.)

Distribution. From Brazil to Canada.

Species:

aequalis Reitter, 1876; Canada, USA, Mexico (JRB)

Barron, J. R. 1971: 65 (syn. *Airora bicolor* Casey, 1916; synonymized by Schaeffer 1920: 193?). Barron, J. R. 1971: 67 (syn. *Airora polita* Casey, 1916; synonymized by author). Barron, J. R. 1971: 67 (syn. *Airora punctiventris* Casey, 1916; synonymized by author)

apicalis Reitter, 1876; Colombia (AL)

Léveillé, A. 1910: 7

bituberculata Léveillé, 1905; Brazil (AL)

Léveillé, A. 1910: 7

canescens Reitter, 1876; Central America (AL)

Léveillé, A. 1910: 7

centralis Sharp, 1891; Mexico, Guatemala, Panama (AL)
Léveillé, A. 1910: 7
cylindrica Serville, 1828; Canada, USA, Mexico (JRB)
Léveillé, A. 1910: 7. Barron, J. R. 1971: 65 (syn. *Airora nigellus* Melsheimer, 1846; synonymized by whom?). Barron, J. R. 1971: 65 (syn. *Airora teres* Melsheimer, 1846; synonymized by author). Böving, A. G. & Craighead, F. C. 1931: 273 (larva). Léveillé, A. 1910: 7 (*Airora teres* Melsheimer, 1846 = syn. *Airora aequalis* Reitter, 1877; synonymized by Léveillé 1910: 7) . Kolibáč, J. 2005: 42 (redescription). Reitter, E. 1876: 21 (syn. *Hypophloeus teres* Melsheimer, 1846)
decipiens Léveillé, 1899; Mexico (AL)
Léveillé, A. 1910: 7
dugesi Léveillé, 1890; Mexico (AL)
Léveillé, A. 1910: 9 (*Temnochilodes*). Kolibáč, J. 2005: 43 (redescription, combination)
ferruginea Léveillé, 1905; Venezuela (AL)
Léveillé, A. 1910: 7
grouvellei Léveillé, 1889; Colombia (AL)
Léveillé, A. 1910: 7
humeralis Léveillé, 1894; Brazil (AL)
Léveillé, A. 1910: 7
longicollis Guérin, 1846; Central and South America (AL)
Léveillé, A. 1910: 7 (syn. *Airora clivinoides* Reitter, 1876; synonymized by author?)
mathani Léveillé, 1878; Bolivia (AL)
Léveillé, A. 1910: 7
minuta Schaeffer, 1918; USA: Arizona, California (JRB)
Barron, J. R. 1971: 69
modesta Léveillé, 1907; Venezuela (AL)
Léveillé, A. 1910: 7
parallelicollis Léveillé, 1894; Brazil, Venezuela (AL)
Léveillé, A. 1910: 7
pollens Sharp, 1891; Mexico (AL)
Léveillé, A. 1910: 7
procera Reitter, 1876; Bolivia, Paraguay (AL)
Léveillé, A. 1910: 7
striatopunctata Reitter, 1876; West Indies, Brazil (AL)
Léveillé, A. 1910: 7
suturata Léveillé, 1894; Brazil (AL)
Léveillé, A. 1910: 7
vicina Léveillé, 1903; Brazil (AL)
Léveillé, A. 1910: 7
wagneri Léveillé, 1907; Argentina (AL)
Léveillé, A. 1910: 8
yucatanica Sharp, 1891; Mexico (AL)
Léveillé, A. 1910: 8

Genus *Alindria* Erichson, 1844
http://species-id.net/wiki/Alindria
Figs 1, 6; Map 5

Erichson, W. F. 1844: 451.

Type species. *Trogossita grandis* Serville, 1828 [designated by Kolibáč 2005]

Léveillé, A. 1910: 8. Kolibáč, J. 2005: 43 (redescription). Kolibáč, J. 2006: 111 (phylogeny). Kolibáč, J. 2007a: 364.

Description. Body size: about 11.0–34.0 mm. Body shape elongate. Gular sutures reduced. Frontoclypeal suture absent. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides present. Submentum of males: ctenidium present. Antennal groove present. Eyes: size flat. Eyes number: two. Epicranial acumination deep. Lacinial hooks absent. Galea: shape elongate. Galea: ciliate setae absent. Mediostipes-Lacinia not fused. Palpifer: outer edge denticulate. Mandibular apical teeth number: two, horizontally situated. Mola reduced but present. Penicillus (at base) present (fine, often membranous). Pubescence above mola or cutting edge absent. Ventral furrow present. Basal notch shallow or absent. Labrum-Cranium not fused. Epipharyngial sclerite present. Lateral tormal process: projection curved downwards, processes not connected (*Airora*). Ligula: ciliate setae absent. Ligula rigid, strongly retroflexed, deeply emarginate. Hypopharyngeal sclerite consisting of two separate parts. Antenna 11-segmented. Antennal club asymmetrical, sensorial fields present. Front coxal cavities externally closed, internally open. Pronotum transverse. Prepectus absent. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron moderate. Elytral interlocking mechanism present, carinae reduced. Elytral punctation regular, scales absent. Wing: radial cell triangular, wedge cell present, cross vein MP3-4 present, cross vein AA1+2-3+4 present. Front tibiae: spines along side large. Hooked spur present. Claws: denticle absent. Parasternites number along ventrites III–VII: two. Spiculum gastrale absent. Tegmen composed of two parts. Coxitae undivided.

Biology. Predatory. Biology unknown; adults are sometimes collected at light.

Distribution. Disjunctive distribution: most species distributed in tropical Africa and Madagascar; about four south-eastern Asian species are also congeneric. Two unidentified specimens from Argentina (Természettudományi Múzeum Budapest) may be mislabelled.

Species:

alluaudi Léveillé, 1894; Madagascar (AL)
Léveillé, A. 1910: 8

alutacea Murray, 1867; Old Calabar (AL)
Léveillé, A. 1910: 8

angusta Léveillé, 1898; Madagascar (AL)
Léveillé, A. 1910: 8

auberti Léveillé, 1905; China: Sichuan (AL)
Léveillé, A. 1910: 8. Kolibáč, J. 2007a: 364

australis Péringuey, 1885; South Africa: Cap, Transvaal (AL)
Léveillé, A. 1910: 8
bicolor Basilewsky, 1956; Rwanda (AD)
Basilewsky, P. 1956: 392
bouvieri Léveillé, 1898; Madagascar (AL)
Léveillé, A. 1910: 8
chevrolati Reitter, 1876; Senegal (AL)
Léveillé, A. 1910: 8
cribrosicollis Léveillé, 1888; Tenasserim (AL)
Léveillé, A. 1910: 8
cyaneicornis Fairmaire, 1887; Madagascar (AL)
Léveillé, A. 1910: 8
docorsei Léveillé, 1901; Madagascar (AL)
Léveillé, A. 1910: 8
elongata Guérin, 1846; Guinea (AL)
Léveillé, A. 1910: 8
grandis Serville, 1825; Senegal, Cap (varA)
Léveillé, A. 1910: 8 (syn. *Alindria cylindrica* Olivier, 1792; synonymized by author?). Kolibáč, J. 2005: 43 (redescription). Léveillé, A. 1910: 8 (syn. *Alindria ingenicula* Gistl & Bromme, 1850; synonymized by author?). Léveillé, A. 1910: 8 (syn. *Alindria major* Guérin, 1825; syn. by author?)
lesnei Léveillé, 1907; East Africa (AL)
Léveillé, A. 1910: 8
orientalis Redtenbacher, 1844; India: Kashmir (AL)
Léveillé, A. 1910: 8
Léveillé, A. 1910: 8 (syn. *Alindria parallela* Léveillé, 1889; synonymized by Kolibáč 2007a); Andamans (AL)
Kolibáč, J. 2007a: 364 (syn. *Alindria parallela* Léveillé, 1889; synonymized by author)
ornata Léveillé, 1898; Congo (AL)
Léveillé, A. 1910: 8
ruandana Basilewsky, 1956; Rwanda (AD)
Basilewsky, P. 1956: 390
sedilloti Léveillé, 1881; Madagascar (AL)
Léveillé, A. 1910: 8. Léveillé, A. 1910: 8 (syn. *Alindria sikorai* Kuwert, 1891; synonymized by author?)
sericea Léveillé, 1898; Madagascar (AL)
Léveillé, A. 1910: 8
spectabilis Klug, 1833; Madagascar (AL)
Léveillé, A. 1910: 8
virescens Léveillé, 1907; "India" (varA)
Léveillé, A. 1910: 9. Kolibáč, J. 2007a: 364

Genus *Corticotomus* Sharp, 1891
http://species-id.net/wiki/Corticotomus
Figs 1, 6; Map 5

Sharp, D. 1891: 390.

Type species. *Corticotomus basalis* Sharp, 1891 [designated by Barron 1971]

Léveillé, A. 1910: 7. Downie, N. M. & Arnett, R. H. Jr. 1996: 936 (key). Kolibáč, J. 2005: 50 (redescription). Kolibáč, J. 2006: 111 (phylogeny). Lepesme, P. & Paulian, R. 1944: 138 (*Colydobius* Sharp, 1891) (key). Léveillé, A. 1910: 20 (*Colydobius* Sharp, 1891).

Colydobius Sharp, 1891 [type species: *Colydobius divisus* Sharp, 1891; designated by Kolibáč 2005]

Léveillé, A. 1910: 20. Kolibáč, J. 2005: 50 (synonymized)

Leveillesoma Lepesme & Paulian,1944 [type species: *Nemosomia fulva* Léveillé, 1905; by original designation]

Lepesme, P. & Paulian, R. 1944: 139. Kolibáč, J. 2005: 50 (synonymized)

Parafilumis Casey, 1916 [type species: *Parafilumis estriata* Casey, 1916; by original designation and monotypy]

Barron, J. R. 1971: 53 (synonymized).

Description. Body size: about 3.0–5.0 mm. Body shape elongate. Gular sutures narrow, subparallel at apex. Frontoclypeal suture absent. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum: ctenidium absent. Antennal groove present. Eyes: size moderate. Eyes number: two. Epicranial acumination deep. Lacinial hooks absent. Galea: shape elongate. Galea: ciliate setae present. Mediostipes-Lacinia not fused. Palpifer: outer edge denticulate. Mandibular apical teeth number: two, horizontally situated. Mola reduced but present. Penicillus (at base) present (fine, often membranous). Pubescence above mola or cutting edge absent. Ventral furrow present. Basal notch shallow or absent. Labrum-Cranium not fused. Epipharyngial sclerite present. Lateral tormal process: projection curved downwards, processes not connected (*Airora*). Ligula: ciliate setae present. Ligula rigid, not retroflexed, weakly emarginate. Hypopharyngeal sclerite sickle shaped. Antenna 11-segmented. Antennal club asymmetrical, sensorial fields present. Front coxal cavities externally closed, internally open. Pronotum elongate. Prepectus absent. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron moderate. Elytral interlocking mechanism present, carinae reduced. Elytral punctation regular, scales absent. Wing: radial cell open (outer vein present), wedge cell absent, cross vein MP3-4 absent, cross vein AA1+2-3+4 absent. Front tibiae: spines along side large. Hooked spur present. Claws: denticle absent. Spiculum gastrale absent. Tegmen composed of two parts. Coxitae undivided.

Biology. Predatory. North American species have been both reared and collected from various species of pine and willow, also from *Rhus*, *Pseudotsuga*, and other trees (Barron 1971, Dajoz 1997). The *Corticotomus* species were mostly found under bark but also in the burrows of *Cryphalus* (Scolytinae) (Barron 1971). Dajoz (1997) noted *C. apicalis* associated with the bark beetle *Chaetophloeus parkinsoniae*. The way of life of *Corticotomus* is probably similar to that of *Nemozoma*.

Distribution. Distributed from Brazil to Canada. One species, unknown to me, is described from Chile.

Species:

apicalis Van Dyke, 1944; Western USA (JRB)

Barron, J. R. 1971: 60. Dajoz, R. 1997: 42 (biology). Van Dyke, E. C. 1944: 151.

basalis Sharp, 1891; Guatemala (AL)

Léveillé, A. 1910: 7. Kolibáč, J. 2005: 50.

bicolor Léveillé, 1895; Chile (AL)

Léveillé, A. 1910: 7.

californicus Van Dyke, 1915; Western USA (JRB)

Barron, J. R. 1971: 60 (syn. *Parafilumis estriata* Casey, T. L. 1916: 207, 283; synonymized by whom?). Van Dyke, E. C. 1915: 28. Schaeffer, C. F. A. 1920: 193.

caviceps Fall, 1910; Western Canada and USA (JRB, varA)

Barron, J. R. 1971: 58. Dajoz, R. 1997: 41 (diagnosis). Barron, J. R. 1971: 58 (syn. *Corticotomus laeviventris* Casey, 1916; synonymized by whom?). Fall, H. C. 1910: Lepesme, P. & Paulian, R. 1944: 140 (*Nemosoma* s.str. *caviceps* Fall, 1910)

cylidricus LeConte, 1863; Eastern USA: Iowa (JRB)

Léveillé, A. 1910: 5 (*Nemosoma*). Barron, J. R. 1971: 57 (syn. *Corticotomus cylindricus* var. *texanus* Schaeffer, 1918). Schaeffer, C. F. A. 1920: 193 (*Corticotomus cylindricus* subsp. *texanus* Schaeffer, C. F. A. 1918: 192). Barron, J. R. 1971: 56. Van Dyke, E. C. 1915: 26. Kolibáč, J. 2005: 51 (redescription). Böving, A. G. & F. C. Craighead, 1931: 273 (larva). Reitter, E. 1876: 14 (*Nemosoma*). Lepesme, P. & Paulian, R. 1944: 140 (*Nemosoma* s.str.)

depressus Schaeffer, 1918; Eastern USA (JRB)

Barron, J. R. 1971: 54. Schaeffer, C. F. A. 1918: 192.

divisus Sharp, 1891; Panama (AL)

Léveillé, A. 1910: 20 (*Colydobius*). Kolibáč, J. 2005: 51 (combination).

dufaui Léveillé, 1907; Guadeloupe (AL)

Léveillé, A. 1910: 20. Kolibáč, J. 2005: 52 (redescription).

fulva Léveillé, 1905; Brazil (AL)

Léveillé, A. 1910: 4 (*Nemosomia*). Kolibáč, J. 2005: 50 (combination). Lepesme, P. & Paulian, R. 1944: 139 (*Nemosomia*) (combined with *Leveillesoma*)

parallelum Melsheimer, 1844; Eastern USA (JRB)

Léveillé, A. 1910: 6 (*Nemosoma*). Barron, J. R. 1971: 55. Lepesme, P. & Paulian, R. 1944: 140 (*Nemosoma*). Reitter, E. 1876: 14 (*Nemosoma*)

quadrimaculatus Léveillé, 1894; Brazil (AL)

Léveillé, A. 1910: 7.

sharpi Léveillé, 1905; Mexico (AL)

Léveillé, A. 1910: 7.

signatus Sharp, 1891; Guatemala (AL)

Léveillé, A. 1910: 20.

testaceus Dajoz, 1997; USA: Arizona (AD)

Dajoz, R. 1997: 40.

† Genus *Cretocateres* Ponomarenko, 1986
http://species-id.net/wiki/Cretocateres
Fig. 19; Map 5

Ponomarenko, A. G. 1986: iii (1–101).

Type species. *Cretocateres mongolicus* Ponomarenko, 1986 [by monotypy and author's designation]

Kolibáč, J. 2006: 116 (classification). Ponomarenko, A. G. 1986: iii (1–101) (Lophocateridae). Ponomarenko, A. G. 1990: 73, 74. Kolibáč, J. 2006: 116 (Trogossitidae: Trogossitini). Ponomarenko, A. G. & Kireichuk, A. G. (2005–2008): http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm (Peltidae). Schmied, H. et al. 2009: 24.

Diagnosis. Body size: probably about 3.0 mm (no scale provided). Body elongate, terminal antennomeres conspicuously asymmetrical. Very similar to Siberian *Thoracotes* (see Ponomarenko 1990). Differences between the two genera are not known to me. Structure of coxae in combination with characteristic antennae allow a classification within Trogossitidae: Trogossitinae; shape of pronotum is closer to Trogossitini than Gymnochilini. See a reproduction of the original table in Fig. 19.

Distribution. Mesozoic: Lower Cretaceous; West Mongolia.

Species:

† *mongolicus* Ponomarenko, 1986; W Mongolia; Lower Cretaceous (varA)
Ponomarenko, A. G. 1986: iii (1–101) (Lophocateridae). Ponomarenko, A. G. 1990: 73, 74. Kolibáč, J. 2006: 116 (Trogossitidae: Trogossitini). Ponomarenko, A. G. & Kireichuk, A. G. (2005–2008): http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm (Peltidae). Schmied, H. et al. 2009: 24

Genus *Dupontiella* Spinola, 1844
http://species-id.net/wiki/Dupontiella
Figs 20–23; Map 5

Spinola, M. 1844 (II): 168.

Type species. *Dupontiella ichneumonoides* Spinola, 1844 [designated by Kolibáč 2005]

Léveillé, A. 1910: 6. Kolibáč, J. 2005: 54. Kolibáč, J. 2006: 116 (phylogeny). Reitter, E. 1876: 15.

Remarks. Body size: about 4.0–5.0 mm. The genus was originally described in Cleridae. Lacordaire (1857: 493) transferred *Dupontiella* to Trogossitidae. Neither species was pinned in Cleridae in Spinola's original collection and I found none in "collectio Chevrolat" (MNHN Paris) where *D. ichneumonoides* could have been placed. Figures 20–23 show a facsimile of Spinola's (1844) original descriptions with figures as well as Reitter's (1876) remarks on the genus.

The 11-segmented antennae with distinct 3-segmented asymmetrical club, as well as perhaps a tri-sinuate anterior margin to the frons, probably indicate proper classifi-

cation within Trogossitinae, perhaps related to *Nemozoma* and allied genera. Spinola's note "[...] *les mandibles de la forme ordinaire, la face antérieurement arrondie et non triéchancrée* [...]" could mean that the mandibles are unidentate. Some species, possibly only specimens of *Corticotomus*, are the only known trogossitids with mandibles that may be unidentate (Kolibáč 2005: 51). On the other hand, the body shape and the complex colour pattern on the dorsal surface of of the body also resemble *Calanthosoma* (Egoliini). Because species of the latter genus are far larger, I tend to support a relationship to *Nemozoma* and *Corticotomus*. Hence the classification of *Dupontiella* within Trogossitini herein.

Distribution. Venezuela.

Species:

fasciatella Spinola, 1844; Venezuela: Caracas (AL)

Léveillé, A. 1910: 6. Reitter, E. 1876: 16

ichneumonoides Spinola, 1844; Venezuela: Caracas (AL)

Léveillé, A. 1910: 6. Kolibáč, J. 2005: 54. Reitter, E. 1876: 15

Genus *Elestora* Pascoe, 1868

http://species-id.net/wiki/Elestora

Fig. 6; Map 5

Pascoe, F. P. 1868: XI.

Type species. *Elestora fulgurata* Pascoe, 1868 [by monotypy]

Léveillé, A. 1910: 20. Kolibáč, J. 2005: 55. Kolibáč, J. 2006: 116 (phylogeny). Reitter, E. 1876: 30.

Remarks. The phylogeny of the genus is unclear and in need of revision, together with *Melambia*. *Elestora* could be related to some species of the latter genus (see "Remarks" on *Melambia*). I presume a classification of *Elestora* within the trogossitins rather than with the gymnochilins.

Description. Body size: 15.0 mm. Body shape flat. Gular sutures wide, convergent at apex. Frontoclypeal suture absent. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum of males: ctenidium present. Antennal groove present. Eyes: size flat. Eyes number: two. Mandibular apical teeth number: one. Labrum-Cranium not fused. Antenna 11-segmented. Antennal club asymmetrical, sensorial fields present. Front coxal cavities externally closed, internally open. Pronotum transverse. Prepectus absent. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron moderate. Elytral interlocking mechanism present, carinae conspicuous. Elytral punctation regular, scales absent. Wing: radial cell oblong (or reduced), wedge cell present, cross vein MP3-4 present, cross vein AA1+2-3+4 present. Front tibiae: spines along side moderate. Hooked spur absent in middle and hind tibiae. Claws: denticle absent.

Biology. Probably predatory. A specimen was observed on a smouldering log at the margin of a tropical forest clearing in Laos. Its light orange spots on the elytra (much duller in a few museum specimens) perfectly imitate wood embers. Very rapid flier.

Distribution. Distributed from Malaysia to northern Laos but perhaps very rare.

Species:

fulgurata Pascoe, 1868; Malaysia: Penang, Laos (varA)

Léveillé, A. 1910: 20. Kolibáč, J. 2005: 55. Kolibáč, J. 2006: 152. Reitter, E. 1876: 30

† Genus *Eotenebroides* Ren, 1995

http://species-id.net/wiki/Eotenebroides

Map 5

Ren, D. 1995: 88 [in Chinese], 189 [in English] (Tenebroidinae, =Trogossitidae, Trogossitinae).

Type species. *Eotenebroides tumoculus* Ren, 1995

Ren, D. 1995: 89 [species description in Chinese only]. Kolibáč, J. & Huang, D.-Y. 2008: 141 (Trogossitini).

English description of the genus. "*Head triangular, longer than wide. Eyes distinct, larger, situated laterally at median. Last 3 segments of antennae not thickened. Basal part of lateral margin of pronotum not narrowed. Scutellum larger. Coxa of middle and hind legs very close. Elytra not longer than abdomen, surface with 5 visible longitudinal streaks. Length 6.1 mm, width 2.4 mm.*" (Ren 1995: 189)

Translation of Chinese description of the species. "*Head: head slightly longer than wide; mandible robust, slightly curved; antenna with 11 segments, scapus a littler longer than others, length of other segments similar to one another, last three segments not thickened; eyes large, around 1/3 as long as head (excluding mandible), not projecting, clearly separated from front edge of pronotum. Thorax: pronotum longer than wide, anterior edge concave, anterio-lateral angles projecting, sharp, posterio-lateral angles rounded, posterior edge straight, as long as anterior edge; connection of pronotum with elytra forming a neck; scutellum large, triangular; metepisternum visible, not making contact with mid-coxa; front coxae transverse, well-separated, femur thick; middle coxae rounded, close to one another, femur thicker than tibia; hind coxae nearly rounded, close to one another, hind femur as wide as middle femur. Elytra: elytra does not reach end of abdomen, its base as wide as pronotum, equipped with 5 longitudinal ridges. Abdomen: 6 sternites visible.*" (Ren 1995: 89)

Distribution. China: SW of Beijing, Chongqing reservoir; Mesozoic: Lower Cretaceous, Lushangfen formation.

Species:

† *tumoculus* Ren, 1995; China: SW of Beijing; Lower Cretaceous (AD)

Ren, D. 1995: 88 [species description in Chinese only]. Kolibáč, J. & Huang, D.-Y. 2008: 141.

Genus *Eupycnus* Sharp, 1891

http://species-id.net/wiki/Eupycnus
Fig. 7; Map 5

Sharp, D. 1891: 415.

Type species. *Eupycnus lentus* Sharp, 1891 [by monotypy]

Léveillé, A. 1910: 14. Kolibáč, J. 2005: 56 (redescription). Kolibáč, J. 2006: 116 (phylogeny).

Description. Body size: about 7.5 mm. Body shape elongate. Gular sutures wide, convergent at apex. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides present. Antennal groove present. Eyes: size flat. Eyes number: two. Epicranial acumination moderate. Mandibular apical teeth number: two, vertically situated. Labrum-Cranium not fused. Ligula: ciliate setae present. Ligula rigid, not retroflexed, weakly emarginate. Hypopharyngeal sclerite consisting of two separate parts. Antenna 11-segmented. Antennal club asymmetrical, sensorial fields present. Front coxal cavities externally closed, internally open. Pronotum subquadrate. Prepectus absent. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron moderate. Elytral interlocking mechanism present, carinae reduced. Elytral punctation regular, scales absent. Wing: radial cell open (outer vein present), wedge cell absent, cross vein MP3-4 absent, cross vein AA1+2-3+4 absent. Front tibiae: spines along side large. Hooked spur present in all tibiae. Claws: denticle absent. Parasternites number along ventrites III–VII: one. Spiculum gastrale present. Tegmen composed of three parts.

Biology. Predatory. The single described species probably has the same way of life as *Tenebroides* species.

Distribution. Mexico. One undescribed species is known to me from Cuba.

Species:

lentus Sharp, 1891; Mexico (AL)

Léveillé, A. 1910: 14. Kolibáč, J. 2005: 56 (redescription)

Genus *Euschaefferia* Leng, 1920

http://species-id.net/wiki/Euschaefferia
Map 5

Leng, C. W. 1920: 193.

Type species. *Stenodema hicoriae* Schaeffer, 1918 [by original designation and monotypy]

Barron, J. R. 1971: 62. Kolibáč, J. 2005: 57. Kolibáč, J. 2006: 116 (phylogeny).

Pseudocotomus Van Dyke, 1944 [type species: *Pseudocotomus mclayi* Van Dyke, 1944; by original designation]

Van Dyke, E. C. 1944: 153. Barron, J. R. 1971: 62 (synonymized).

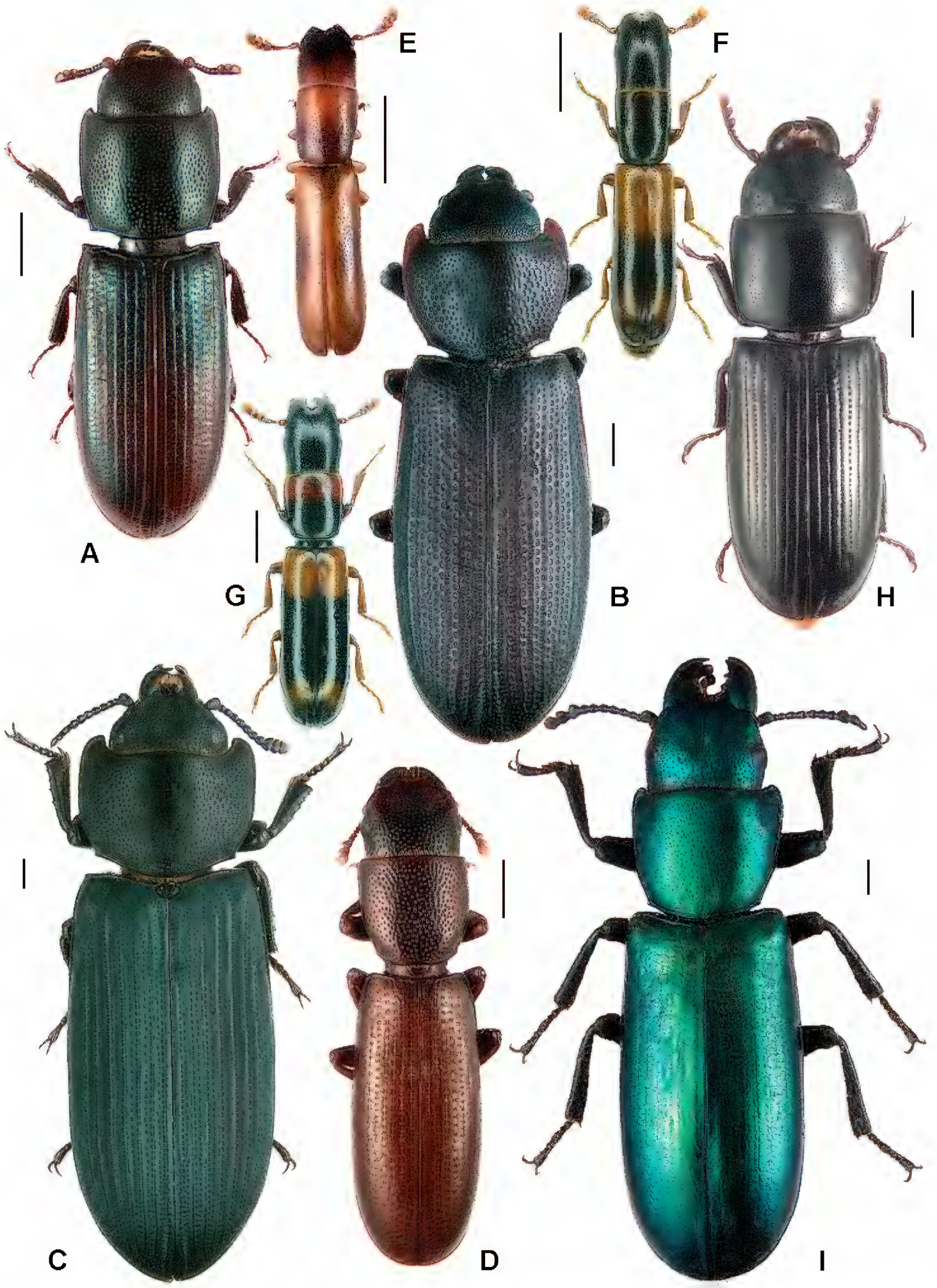


Figure 7. A *Eupycnus lentus* **B** *Melambia crenicollis* **C** *Melambia striata* **D** *Leipaspis lauricola* **E** *Nemozoma cornutum* **F** *Nemozoma elongatum* **G** *Nemozoma caucasicum* **H** *Parallelodera quadraticollis* **I** *Temnoscheila pini*.

Stenodema Schaeffer, 1918 (preoccupied) [type species: *Stenodema hicoriae* Schaeffer, 1918; by original designation]

Barron, J. R. 1971: 62. Leng, C. W. 1920: 193. Schaeffer, C. F. A. 1918: 193.

Description. Body size: 2.0–3.0 mm. Body shape elongate. Frons: longitudinal groove or depression absent. Labrum-Cranium not fused. Antenna 11-segmented. Antennal club asymmetrical. Pronotum elongate. Elytra: long hairs absent, carinae reduced. Elytral punctation irregular, scales absent. Front tibiae: spines along side reduced. Hooked spur absent in middle and hind tibiae. Claws: denticle absent.

Biology. Predatory. It was recorded from the galleries of the bark beetle *Pseudothysanoes burtoni* and has also been reared on the plant *Vachellia farnesiana* (Barron 1971).

Distribution. Belt of the southern states of the USA.

Species:

hicoriae Schaeffer, 1918; USA: Texas, North Carolina (JRB)

Barron, J. R. 1971: 63. Kolibáč, J. 2005: 57. Schaeffer, C. F. A. 1918: 193

mclayi Van Dyke, 1944; USA: California (JRB)

Barron, J. R. 1971: 63 (comb). Van Dyke, E. C. 1944: 153. (*Pseudocotomus*)

Genus *Leipaspis* Wollaston, 1862

http://species-id.net/wiki/Leipaspis

Figs 1, 7; Map 5

Wollaston, T. V. 1862: 140.

Type species. *Leipaspis lauricola* Wollaston, 1862 [designated by Kolibáč 2005].

Léveillé, A. 1910: 14 (*Lipaspis*). Kolibáč, J. 2005: 63 (redescription). Kolibáč, J. 2006: 111 (phylogeny). Kolibáč, J. 2007a: 364. Reitter, E. 1876: 27 (*Lipaspis*).

Description. Body size: about 8.5–9.5 mm. Body shape elongate. Gular sutures wide, convergent at apex. Frontoclypeal suture absent. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum: ctenidium absent. Antennal groove present. Eyes: size flat. Eyes number: two. Epicranial acumination moderate. Lacinial hooks absent. Galea: shape elongate. Galea: ciliate setae present. Mediostipes-Lacinia not fused. Palpifer: outer edge denticulate. Mandibular apical teeth number: two, horizontally situated. Mola absent. Penicillus (at base) present (fine, often membranous). Pubescence above mola or cutting edge absent. Ventral furrow present. Basal notch shallow or absent. Labrum-Cranium not fused. Epipharyngial sclerite present. Lateral tormal process: projection curved downwards, processes not connected (*Airora*). Ligula: ciliate setae present. Ligula rigid, not retroflexed, deeply emarginate. Hypopharyngeal sclerite sickle shaped. Antenna 11-segmented. Antennal club asymmetrical, sensorial fields present. Front coxal cavities externally closed, internally open. Pronotum elongate. Prepectus absent. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron moderate. Elytral interlocking mechanism present, carinae reduced. Elytral punctation regular, scales absent. Front tibiae: spines along side reduced. Hooked spur absent, apical spurs not

hooked or weakly hooked. Claws: denticle absent. Parasternites number along ventrites III–VII: one. Spiculum gastrale absent. Coxitae divided.

Biology. Predatory. The species was collected on the stems of various plants, such as *Euphorbia* sp., *Pinus* sp., *Suadea vermiculata*, *Arthrocnemum fruticosum*, *Laurus nobilis*, and *Nicotiana glauca*, probably preying on anobiids (*Xestobium*) or other xylophagous insects.

Distribution. Canary Islands.

Species:

caulicola Wollaston, 1862;

Léveillé, A. 1910: 14 (*Lipaspis*). Plata-Negrache, P. & Prendes-Ayala, C. 1981: 227. Reitter, E. 1876: 27 (*Lipaspis*)

caulicola caulicola Wollaston, 1862; Canary Islands (varA)

Kolibáč, J. 2007a: 364

caulicola oceanica Wollaston, 1865; Madeira: Selvagens (varA)

Erber, D. & Wheater, C. P. 1987: 166 (*Leipaspis caulicola* var. *oceanica* Wollaston, 1865). Kolibáč, J. 2007a: 364 (subspecies)

lauricola Wollaston, 1862; Canary Islands (varA)

Léveillé, A. 1910: 14 (*Lipaspis*). Kolibáč, J. 2005: 63. Reitter, E. 1876: 27 (*Lipaspis*)

lauricola lauricola Wollaston, 1862; Canary Isl: La Palma, Tenerife (varA)

Plata-Negrache, P. & C. Prendes-Ayala 1981: 229. Kolibáč, J. 2007a: 364

lauricola gomerensis Plata & Prendes, 1981 Canary Isl.: La Gomera, El Hierro (varA)

Kolibáč, J. 2007a: 364. Machado, A. & Oromí, P. 2000: ii. Plata-Negrache, P. & Prendes-Ayala, C. 1981: 229

pinicola Wollaston, 1862; Canary Islands (varA)

Léveillé, A. 1910: 14 (*Lipaspis*). Kolibáč, J. 2007a: 364. Plata-Negrache, P. & Prendes-Ayala, C. 1981: 229. Reitter, E. 1876: 27

Genus *Melambia* Erichson, 1844

http://species-id.net/wiki/Melambia

Fig. 7; Map 5

Erichson, W. F. 1844: 450.

Type species. *Trogossita gigas* Fabricius, 1798 [designated by Kolibáč 2005]

Léveillé, A. 1910: 9. Kolibáč, J. 2005: 68 (redescription). Kolibáč, J. 2006: 111 (phylogeny). Kolibáč, J. 2007a: 364. Mamaev, B. M. 1976: 1652 (larva). Reitter, E. 1876: 24.

Remarks. The placement of the genus in Trogossitini should be revised because my analysis of 2008 disclosed a possible relationship of some its species with Gymnochilini. There are distinct differences in the body shape among the numerous species of *Melambia*, for example between *M. grandis* (a robust species with a cordate pronotum) and *M. orientalis* (an elongate species with pronotum shaped somewhat like that of *Tenebroides*). Consideration of a re-classification of *Seidlitzella* within Gymnochilini,

similar in habitus to *Melambia*, needs species revision and new phylogenetic analysis with reference to Trogossitini and Gymnochilini, including special attention to the related trogossitine genus *Alindria*. As a preliminary opinion, I assume that both genera, *Melambia* and *Alindria*, form a basal group of Trogossitini.

Description. Body size: about 20.0–30.0 mm. Body shape elongate. Gular sutures reduced. Frontoclypeal suture absent. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum of males: ctenidium present. Antennal groove present. Eyes: size flat. Eyes number: two. Epicranial acumination moderate. Lacinial hooks absent. Galea: shape clavate. Galea: ciliate setae absent. Mediostipes-Lacinia fused together. Palpifer: outer edge denticulate. Mandibular apical teeth number: two, vertically situated. Mola absent. Penicillus (at base) present (fine, often membranous). Pubescence above mola or cutting edge absent. Ventral furrow present. Basal notch moderate. Labrum-Cranium not fused. Epipharyngial sclerite present. Lateral tormal process: projection curved downwards, processes not connected (*Airora*). Ligula: ciliate setae absent. Ligula rigid, weakly retroflexed, deeply emarginate. Hypopharyngeal sclerite absent. Antenna 11-segmented. Antennal club asymmetrical, sensorial fields present. Front coxal cavities externally closed, internally open. Pronotum transverse. Prepectus absent. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron thin. Elytral interlocking mechanism present, carinae conspicuous. Elytral punctation regular, scales absent. Wing: radial cell oblong (or reduced), wedge cell present, cross vein MP3-4 present, cross vein AA1+2-3+4 absent. Front tibiae: spines along side moderate. Hooked spur present. Claws: denticle absent. Parasternites number along ventrites III–VII: two. Spiculum gastrale absent. Tegmen composed of two or three parts.

Larva: Frontal arms V-shaped. Epicranial stem present. Endocarina present. Stemmata number: five. Maxillary palpi 3-segmented. Palpifer absent. Mala simple. Mala: bidentate protrusion absent. Cardo-Stipes not fused. Cardo: size much smaller than stipes. Ligula absent. Labial palpi 2-segmented. Prementum in single part, anterior margin with notch.Thoracic sclerites pattern (dorsally) 2-0-0. Abdominal segment IX not divided. Tergite IX flat. Urogomphi minute; median process absent.

Biology. Predatory. According to Mamaev (1976), *M. tekkensis* and *M. cardoni* larvae prey on larvae of jewel beetles and longhorn beetles (under the bark of, for example, apricot trees or *Grewia*).

Distribution. South-eastern, southern and central Asia; also several species in Africa from Egypt to South Africa. Such a disjunctive distribution is possible, but the African species need to be checked because of possible confusion with the similar genus *Alindria*.

Species:

cardoni Léveillé, 1908; India: "Bengalia"(AL)

Léveillé, A. 1910: 9

cordicollis Reitter, 1876; Philippines (AL)

Léveillé, A. 1910: 9. Reitter, E. 1876: 25

crenicollis Guérin, 1846; India: "Bengalia" (AL)

Léveillé, A. 1910: 9

funebris Pascoe, 1862; Cambodia (AL)
Léveillé, A. 1910: 9. Reitter, E. 1876: 25
gautardi Tournier, 1872; Egypt (AL)
Léveillé, A. 1910: 9. Kolibáč, J. 2007a: 364. Reitter, E. 1876: 26
gigas Fabricius, 1798; Guinea, Senegal (AL)
Léveillé, A. 1910: 9. Kolibáč, J. 2005: 68 (redescription). Reitter, E. 1876: 25
maura Pascoe, 1862; South Africa: "N'gami", Mauritania (varA)
Léveillé, A. 1910: 9. Mateu, J. 1972: 547
memnonia Pascoe, 1862; Sri Lanka (AL)
Léveillé, A. 1910: 9
opaca Reitter, 1876; South Africa: Cap (AL)
Léveillé, A. 1910: 9. Reitter, E. 1876: 25
pumila Léveillé, 1885; Burma (AL)
Léveillé, A. 1910: 9
striata Olivier, 1790; Senegal (varA)
Léveillé, A. 1910: 9. Mateu, J. 1972: 547. Reitter, E. 1876: 24
subcyanea Gerstaecker, 1871; Zanzibar (AL)
Léveillé, A. 1910: 9. Reitter, E. 1876: 26
Léveillé, A. 1910: 9 (syn. *Melambia coeruleata* Fairmaire, 1882) Somalia (AL)
tekkensis Koenig, 1889; „Transcaspia", Turkmenistan (varA)
Léveillé, A. 1910: 9. Kolibáč, J. 2007a: 364. Mamaev, B. M. 1976: 1650 (larva)

Genus *Nemozoma* Latreille, 1804
http://species-id.net/wiki/Nemozoma
Figs 7, 15; Map 5

Latreille, P. A. 1804: 239.

Type species. *Dermestes elongatus* Linnaeus, 1760 [by monotypy]
Léveillé, A. 1910: 5. Barron, J. R. 1971: 45. Crowson, R. A. 1964a: 299. Kolibáč, J. 2005: 72 (redescription). Kolibáč, J. 2006: 111 (phylogeny). Kolibáč, J. 2007a: 364. Kolibáč, J. et al. 2005: 31+135 (key). Lepesme, P. & Paulian, R. 1944: 139 (subgen. *Nemosoma* s.str.). Lucht, W. 1998: 207 (key). Mamaev, B. M. 1976: 1652 (larvae). Nikitsky, N. B. 1974: 563. Reitter, E. 1876: 13.
Aponemosoma Lepesme & Paulian, 1944 (subgenus) [type species: *Nemosoma caucasicum* Ménétries, 1832; by original designation]
Barron, J. R. 1971: 45 (synonymized). Kolibáč, J. 2007a: 364. Lepesme, P. & Paulian, R. 1944: 139 (*Nemosoma* subgen. *Aponemosoma*).
Cylidrella Sharp, 1891 [type species: *Cylidrella mollis* Sharp, 1891; by monotypy]
Léveillé, A. 1910: 6. Barron, J. R. 1971: 52. Kolibáč, J. 2005: 72 (synonymized). Kolibáč, J. 2007a: 364.

Monesoma Léveillé, 1894 (subgenus) [type species: *Nemosoma cornutum* Sturm, 1826; by original designation]

Léveillé, A. 1910: 6 (subgenus). Barron, J. R. 1971: 45 (=*Sturmia* Ragusa, 1892). Kolibáč, J. 2007a: 364. Lepesme, P. & Paulian, R. 1944: 139 (synonymized).

Nemosomia Reitter, 1876 [type species: *Nemosomia vorax* Reitter, 1876; by original designation]

Léveillé, A. 1910: 4. Barron, J. R. 1971: 45. Kolibáč, J. 2007a: 364. Lepesme, P. & Paulian, R. 1944: 139 (subgenus). Reitter, E. 1876: 11.

Paranemosoma Lepesme & Paulian,1944 (subgenus) [type species: *Nemosoma punctatum* Léveillé, 1886; by original designation]

Lepesme, P. & Paulian, R. 1944: 139. Kolibáč, J. 2007a: 364.

Sturmia Ragusa, 1892 [type species: *Nemosoma cornutum* Sturm, 1826; by original designation]

Barron, J. R. 1971: 45 (preoccupied, synonymized with *Monesoma*). Kolibáč, J. 2007a: 364.

Pseudalindria Fall, 1910 [type species: *Pseudalindria fissiceps* Fall, 1910; by original designation]

Barron, J. R. 1971: 45. Fall, H. C. 1910: 126. Kolibáč, J. 2007a: 364.

Description. Body size: about 2.5–5.0 mm. Body shape elongate. Gular sutures wide, convergent at apex. Frontoclypeal suture absent. Frons: longitudinal groove or depression present. Cranium ventrally: tufts of long setae at sides present. Submentum: ctenidium absent. Antennal groove present. Eyes: size flat. Eyes number: two. Epicranial acumination moderate. Lacinial hooks absent. Galea: shape elongate. Galea: ciliate setae present. Mediostipes-Lacinia fused together. Palpifer: outer edge even. Mandibular apical teeth number: two, vertically situated. Mola absent. Penicillus (at base) absent. Pubescence above mola or cutting edge absent. Ventral furrow present. Basal notch moderate. Labrum-Cranium not fused. Epipharyngial sclerite present. Lateral tormal process: projection projection not developed (all remaining). Ligula: ciliate setae present. Ligula membranous, not retroflexed, deeply emarginate. Hypopharyngeal sclerite absent. Antenna 11-segmented or 10-segmented. Antennal club asymmetrical, sensorial fields present. Front coxal cavities externally closed, internally open. Pronotum elongate. Prepectus absent. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron thin. Elytral interlocking mechanism present, carinae reduced. Elytral punctation regular, scales absent. Wing: radial cell open (outer vein present), wedge cell absent, cross vein MP3-4 present, cross vein AA1+2-3+4 absent. Front tibiae: spines along side large. Hooked spur present. Claws: denticle absent. Parasternites number along ventrites III–VII: one. Spiculum gastrale absent. Tegmen composed of three parts . Coxitae undivided.

Larva: Frontal arms V-shaped. Epicranial stem reduced. Endocarina present. Gular sutures conspicuous, parallel. Gula: anterior apodemes absent. Paragular sclerites present. Stemmata number: five. Mandibular apical teeth number: one tooth. Lacinia mandibulae with several small spines. Mola absent. Maxillary palpi 3-segmented. Palpifer absent. Pedunculate seta present. Mala simple. Mala: bidentate protrusion absent. Cardo: size

much smaller than stipes. Ligula absent. Labial palpi 2-segmented. Prementum in single part, anterior margin with notch. Antennal joints 1 and 2 elongate. Sensory appendix medium sized (to half of joint 3). Thoracic sclerites pattern (dorsally) 1-2-2. Thoracic sclerites pattern (ventrally) 3+1+1. Trochanter triangular. Abdominal segment IX not divided. Tergite IX flat. Urogomphi present, hooked; median process absent.

Biology. Predatory. Adults live together with larvae under the bark of deciduous and coniferous trees and shrubs, hunting especially for bark beetles.

Distribution. From Brazil to Canada, Europe including European part of Russia, Near East (Turkey, Syria), North Africa. No records are known from Asia east of Caucasus.

Species:

alasanicum Fursov, 1930; Georgia (varA)

Fursov, N. I. 1930: 183. Lepesme, P. & Paulian, R. 1944: 140 (subgen. *Nemosoma* s. str.)

attenuatum Van Dyke, 1915; USA: California, Washington (JRB)

Barron, J. R. 1971: 47. Lepesme, P. & Paulian, R. 1944: 140 (*Nemosoma* s.str.). Sakamoto, J. M. 2007: 342 (distribution). Van Dyke, 1915: 26

brasiliense Léveillé, 1900; Brazil: Jatahy (varA)

Lepesme, P. & Paulian, R. 1944: 138 (combined from *Monesoma*)

breviatum Peyerimhoff, 1918; Algeria (varA)

Peyerimhoff, P. M., de 1918: 329. Hallan, J. 2007–2012: http://insects.tamu.edu (syn. of *N. elongatum*?). Kolibáč, J. 2009: 128

Note: Brustel, H. (pers. comm., 2011) newly recorded 15 specimens from North Africa; he compared Palaearctic species and found *N. breviatum* valid

caucasicum Ménétries, 1832; Austria, Poland, SW Russia, Slovakia, Ukraine, „Caucasus“ (varA)

Léveillé, A. 1910: 6 (*Monesoma*). Hilszczanski, J. 2006: 29. Klausnitzer, B. 1996: 148 (larva). Kolibáč, J. 1993b: 90. Kolibáč, J. 1993a: 19, 21. Kolibáč, J. 2007a: 364 (syn. *Nemozoma fasciicole* Hampe, 1864). Lepesme, P. & Paulian, R. 1944: 141 (*Aponemosoma*). Mamaev, B. M. 1976: 1653 (larva). Milkowski, M. & Wojas, T. 2008: 172 (distribution). Nikitsky, N. B. 1974: 566 (larva). Pankow, W. 2010: 87 (distribution). Reitter, E. 1876: 13

Kolosov, ? 1931: 116 (syn. *Nemosoma curtulum* Fursov, 1930); „Chernyi les“(varA)

Fursov, N. I. 1930: 182 (*Nemosoma curtulum* Fursov, 1930; synonymized by Kolosov 1931: 116 after Hallan 2007–2012; reference not found)

championi Wickham, 1916; Western USA: Colorado, New Mexico (JRB)

Barron, J. R. 1971: 52 (*Cylidrella*). Wickham, 1916: 147

cornutum Sturm, 1826; SW Russia, Ukraine, „Caucasus“(varA)

Léveillé, A. 1910: 6. Klausnitzer, B. 1996: 148 (larva). Kolibáč, J. 2007a: 364. Lepesme, P. & Paulian, R. 1944: 140 (*Nemosoma* s.str.). Mamaev, B. M. 1976: 1654 (larva). Moragues, G. 1981: 262–263 (distribution). Nikitsky, N. B. 1974: 566 (larva). Reitter, E. 1876: 14. Sarikaya, O. & Avci, M. 2009: 253–264 (biology)

cupressi Van Dyke, 1944; USA: Nothern coast of California (JRB)

Barron, J. R. 1971: 51. Van Dyke, E. C. 1944: 147, 149

cylindricolle Fursov, 1930; Georgia (varA)

Fursov, N. I. 1930: 182. Lepesme, P. & Paulian, R. 1944: 140 (*Nemosoma* s.str.)

elongatum Linnaeus, 1761; Europe, Syria, Turkey, Tunisia (JK)

Léveillé, A. 1910: 5. Baader, E. J. 1989: 1 (biology). Bahillo de la Puebla P. & López-Colón, J. I. 2004: 129. Baier, P. 1994: 51 (biology). Baier, P. 1991: 421 (biology). Borowiec, L. 1983: 8. Burakowski, B., Mroczkowski, M. & Stefanska, J. 1986: 115. Conrad, R. 1995: 190–195 (contribution). Cunev, J. 1999: 76. Dippel, C. 1991: 473 (biology). Dippel, C. 1995: 67 (biology). Dippel, C. 1996: 391 (biology). Dippel, C. et al 1997: 161 (biology). Gobbi, G. 1983: 52. Gueorguiev, B. et al. 2003: 107 (distribution). Heuer, H. & Vite, J. P. 1984a: 214 (biology). Heuer, H. & Vite, J. P. 1984b: 586 (biology). Hallan, J. 2007–2012: 4 (syn. *Nemosoma breviatum* Peyrimhoff, 1918?). Klausnitzer, B. 1976: 5. Klausnitzer, B. 1978: 176. Klausnitzer, B. 1996: 146 (larva). Kolibáč, J. 1993a: 21. Kolibáč, J. 1993b: 90. Kolibáč, J. 1996: 473. Kolibáč, J. 2005: 72 (redescription). Kolibáč, J. 2007a: 365 (syn. *Nemozoma fasciatum* Panzer, 1796; in *Colydium*). Kolibáč, J. 2007a: 364 (syn. *Nemozoma corsicum* Reitter, 1876). Kolibáč, J. 2007a: 365 (syn. *Nemozoma siculum* Ragusa, 1891). Kolibáč, J. 2007a: 365 (syn. *Nemozoma syriacum* Pic, 1901). Kolibáč, J. 2007a: 365 (syn. *Nemozoma elongatum* var. *tuniseum* Pic, 1900). Lepesme, P. & Paulian, R. 1944: 140 (*Nemosoma* s.str.). Mamaev, B. M. 1976: 1654 (larva). Mitter, H. 1998: 559. Nikitsky, N. B. 1974: 566 (larva). Peyrimhoff, 1918: 329 (*Nemozoma breviatum*; valid species: H. Brustel, pers. comm. 2011). Pileckis, S. & V. Monsevičius 1995: 271. Reitter, E. 1876: 13 (syn. *Nemozoma corsicum* Ratti, E. 1997: 179. Reitter, 1876; synonymized by Léveillé 1889: 8). Skatulla, U. & Feicht, E. 1992: 4 (biology). Szafraniec, S. 1997: 207 (distribution). Vogt, H. 1967: 15. Wigger, H. 1993: 68 (biology). Wigger, H. 1994: 8 (biology). Wigger, H. 1996: 55 (biology)

fissiceps Fall, 1910; USA: California, Oregon (JRB)

Barron, J. R. 1971: 49. Fall, H. C. 1910: 127

gounellei Léveillé, 1894; Brazil (AL)

Léveillé, A. 1910: 6

landesi Léveillé, 1901; Martinica (AL)

Léveillé, A. 1910: 4. Lepesme, P. & Paulian, R. 1944: 139 (subgen. *Nemosomia*)

maculata Dajoz, 1991; USA (AD)

Dajoz, R. 1991: 245 (*Cylidrella*)

mollis Sharp, 1891; Guatemala (AL)

Léveillé, A. 1910: 6 (*Cylidrella*). Kolibáč, J. 2005: 73 (redescription, combination)

picta Léveillé, 1889; Brazil (AL)

Léveillé, A. 1910: 4 (*Nemosomia*)

pujoli Léveillé, 1902; Brazil (AL)

Léveillé, A. 1910: 4

punctatum Léveillé, 1888; Brazil (AL)

Léveillé, A. 1910: 6. Lepesme, P. & Paulian, R. 1944: 140

punctulata Van Dyke, 1920; Canada: British Columbia to USA: California (JRB)
Barron, J. R. 1971: 49. Lepesme, P. & Paulian, R. 1944: 140. Van Dyke, E. C. 1916: 71, 72 (described as *punctatum*). Van Dyke, E. C. 1920: 85 (jun. homonym; renamed)
schwarzi Schaeffer, 1918; USA: Arizona, California (JRB)
Barron, J. R. 1971: 48. Lepesme, P. & Paulian, R. 1944: 140 (*Nemosoma* s.str.). Schaeffer, C. F. A. 1918: 191 (subgen. *Monesoma*)
signatum Sharp, 1891; Guatemala (AL)
Léveillé, A. 1910: 6
simoni Léveillé, 1889; Venezuela (AL)
Léveillé, A. 1910: 4 (*Nemosomia*). Lepesme, P. & Paulian, R. 1944: 140
vorax Reitter, 1876; Columbia (AL)
Léveillé, A. 1910: 4 (*Nemosomia*). Lepesme, P. & Paulian, R. 1944: 141. Reitter, E. 1876: 12 (*Nemosomia*)

Genus *Parallelodera* Fairmaire, 1881

http://species-id.net/wiki/Parallelodera
Fig. 7; Map 5

Fairmaire, L. 1881: 256.

Type species. *Parallelodera quadraticollis* Fairmaire, 1881 [by monotypy]
Léveillé, A. 1910: 8. Kolibáč, J. 2005: 74 (redescription). Kolibáč, J. 2006: 116 (phylogeny).

Description. Body size: about 11.0–12.0 mm. Body shape elongate. Gular sutures wide, convergent at apex. Frontoclypeal suture present. Frons: longitudinal groove or depression present. Cranium ventrally: tufts of long setae at sides present. Submentum of males: ctenidium absent. Antennal groove present. Eyes: size flat. Eyes number: two. Mandibular apical teeth number: two, vertically situated. Antenna 11-segmented. Antennal club asymmetrical, sensorial fields present. Front coxal cavities externally closed, internally open. Pronotum subquadrate. Prepectus absent. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron thin. Elytral interlocking mechanism present, carinae reduced. Elytral punctation regular, scales absent. Wing: radial cell open (outer vein present), wedge cell absent, cross vein MP3-4 absent, cross vein AA1+2-3+4 absent. Front tibiae: spines along side large. Hooked spur present in all tibiae. Claws: denticle absent.

Biology. In the light of a presumable relationship with *Airora* and *Temnoscheila*, I suggest a predatory way of life.

Distribution. Pacific islands as listed with the particular species.

Species:
luteicornis Fairmaire, 1881; Fiji, Viti Isl. (AL)
Léveillé, A. 1910: 8. Kolibáč, J. 2005: 75

parallelus Fairmaire, 1850; New Caledonia, Madera, Nuka-Hiva, Tahiti (JK)
Léveillé, A. 1910: 18 (*Tenebroides*). Léveillé, A. 1910: 18 (syn. *Tenebroides serratus* Wollaston, 1854). Kolibáč, J. 2005: 75 (combination)
quadraticollis Fairmaire, 1881; Fiji, Viti Isl. (AL)
Léveillé, A. 1910: 8. Kolibáč, J. 2005: 74 (redescription)

Genus *Temnoscheila* Westwood, 1830

http://species-id.net/wiki/Temnoscheila
Figs 7, 8; Map 5

Westwood, J. O. 1830: 231.

Type species. *Trogossita caerulea* Olivier, 1790 [by monotypy]
Downie, N. M. & Arnett, R. H., Jr. 1996: 937 (key). Kolibáč, J. 2005: 83 (redescription). Kolibáč, J. 2006: 109 (review of larvae), 111 (phylogeny). Kolibáč, J. 2007a: 365. Spahr, U. 1981: 74 (amber and copal fossils).
Temnochila Erichson, 1844 (unjustified emendation by Erichson 1844: 449)
Léveillé, A. 1910: 9. Barron, J. R. 1971: 70. Kolibáč, J. 2007a: 365 (unjustified emendation). Nikitsky, N. B. 1992: 80.
Trogossita Olivier, 1790 [type species: *Trogossita caerulea* Olivier, 1790]
Barron, J. R. 1971: 70. Crowson, R. A. 1964a: 299. Mamaev, B. M. 1976: 1652 (larva). Matthews, E. G. 1992: 3. Reitter, E. 1876: 26 (*Trogosita*).

Description. Body size: about 9.0–26.0 mm. Body shape elongate. Gular sutures reduced. Frontoclypeal suture absent. Frons: longitudinal groove or depression present. Cranium ventrally: tufts of long setae at sides present. Submentum of males: ctenidium present. Antennal groove present. Eyes: size flat. Eyes number: two. Epicranial acumination deep. Lacinial hooks absent. Galea: shape elongate. Galea: ciliate setae present. Mediostipes-Lacinia not fused. Palpifer: outer edge denticulate. Mandibular apical teeth number: two, vertically situated. Mola absent. Penicillus (at base) present (fine, often membranous). Pubescence above mola or cutting edge absent. Ventral furrow present. Basal notch shallow or absent. Labrum-Cranium not fused. Epipharyngial sclerite present. Lateral tormal process: projection curved downwards, processes not connected (*Airora*). Ligula: ciliate setae absent. Ligula rigid, weakly retroflexed, deeply emarginate. Hypopharyngeal sclerite sickle shaped. Antenna 11-segmented. Antennal club asymmetrical, sensorial fields present. Front coxal cavities externally closed, internally open. Pronotum elongate. Prepectus absent. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron moderate. Elytral interlocking mechanism present, carinae reduced. Elytral punctation regular, scales absent. Wing: radial cell triangular, wedge cell present, cross vein MP3-4 present, cross vein AA1+2-3+4 absent. Front tibiae: spines along side moderate. Hooked spur present. Claws: denticle absent. Parasternites number along ventrites III–VII: one. Coxitae undivided.

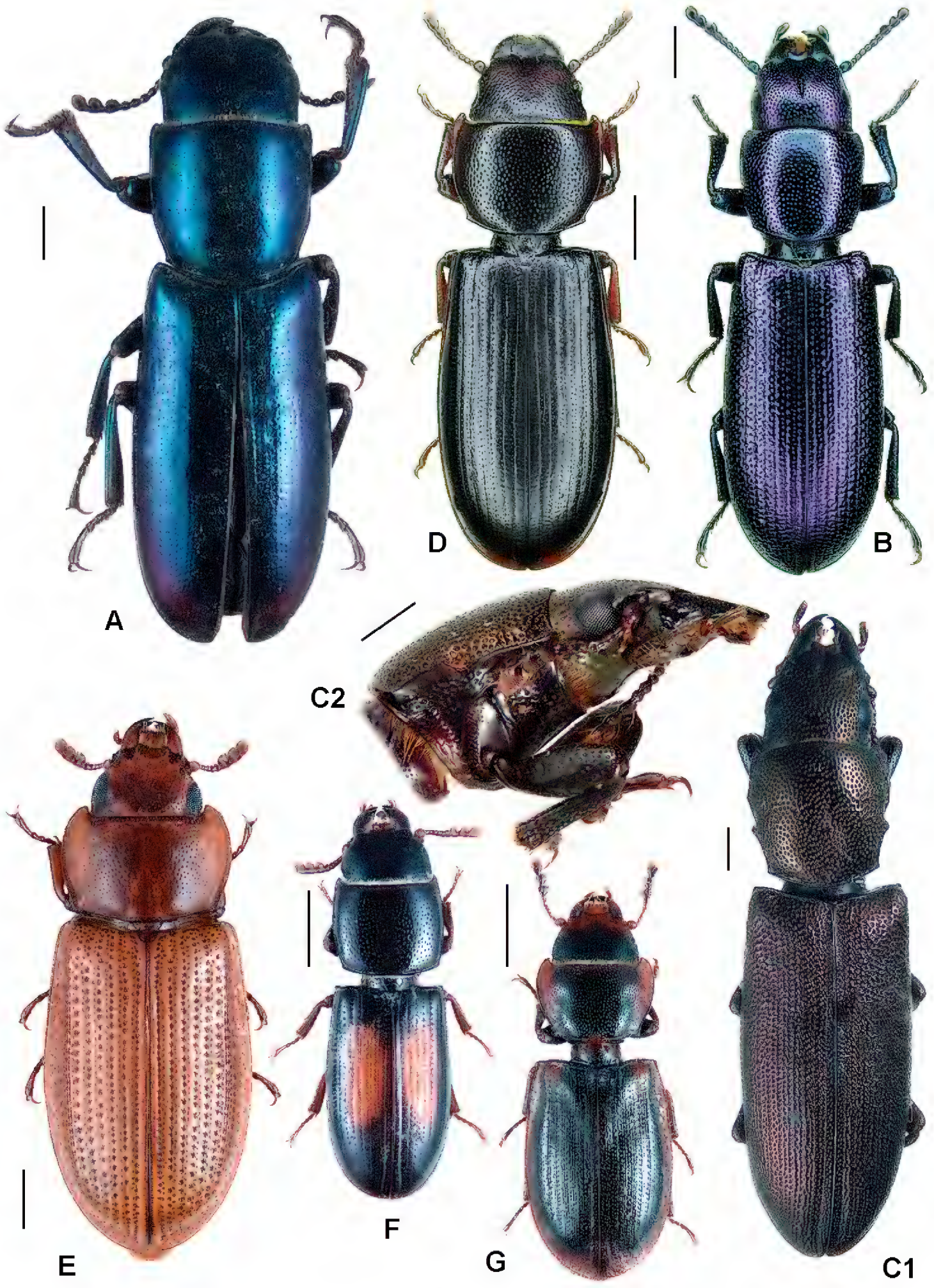


Figure 8. A *Temnoscheila smaragdina* **B** *Temnoscheila caerulea* **C** *Temnoscheila punctatissima* **D** *Tenebroides mauritanicus* **E** *Tenebroides ruber* **F** *Tenebroides bipustulatus* **G** *Tenebroides fossulatus.*

Larva: Frontal arms V-shaped. Epicranial stem reduced. Endocarina present. Gular sutures conspicuous, parallel. Gula: anterior apodemes absent. Paragular sclerites present. Hypostomal rods present. Stemmata number: five. Mandibular apical teeth number: two, horizontally even, vertically situated. Lacinia mandibulae with several small spines. Mola absent. Maxillary palpi 3-segmented. Palpifer absent. Pedunculate seta present. Mala simple. Mala: bidentate protrusion absent. Cardo-Stipes partially fused. Cardo: size much smaller than stipes. Ligula present. Labial palpi 2-segmented. Prementum in single part, anterior margin projecting. Torma: two separate lateral sclerites. Antennal joints 1 and 2 elongate. Sensory appendix very small. Thoracic sclerites pattern (dorsally) 1-2-2. Thoracic sclerites pattern (ventrally) 3+1+1. Trochanter oblong. Abdominal segment IX not divided. Tergite IX flat. Urogomphi present, hooked; median process absent.

Biology. Predatory. Adults hunt for xylophagous beetles on logs and branches of various trees and shrubs. Larvae live mostly under bark but sometimes dwell on the surface of wood as well.

Distribution. The bulk of species are distributed in the two Americas. Only a few species spread through to the Palaearctic region. Several species tend to cosmopolitanism (*T. caerulea*, *T. virescens*).

Species:

acuta LeConte, 1858; Texas (JRB)

Léveillé, A. 1910: 10 (*Temnochila*). Barron, J. R. 1971: 85 (*Temnochila*)

aenea Olivier, 1790; Brazil, Porto Rico (AL)

Léveillé, A. 1910: 10 (*Temnochila*)

aerea LeConte, 1858; Guatemala (JRB)

Léveillé, A. 1910: 10 (*Temnochila*). Barron, J. R. 1971: 78 (*Temnochila*). Barron, J. R. 1971: 78 (syn. *Temnochila virescens* var. *nyentia* Dow, 1912). Dow, R. P. 1912: 70

alticola Sharp, 1891

Léveillé, A. 1910: 10 (*Temnochila*)

aureola Reitter, 1875; Mexico (AL)

Léveillé, A. 1910: 10

aurora Reitter, 1875; Brazil (AL)

Léveillé, A. 1910: 10 (*Temnochila*)

barbata LeConte, 1863; "Cap S. Lucas" (JRB)

Léveillé, A. 1910: 10 (*Temnochila*). Barron, J. R. 1971: 73 (*Temnochila*)

bedeli Léveillé, 1889; Venezuela (AL)

Léveillé, A. 1910: 10 (*Temnochila*)

belti Sharp, 1891; Nicaragua (AL)

Léveillé, A. 1910: 10 (*Temnochila*)

biolleyi Léveillé, 1903; Costa Rica (AL)

Léveillé, A. 1910: 10 (*Temnochila*)

boboensis Sharp, 1891; Mexico (AL)

Léveillé, A. 1910: 10

boliviensis Léveillé, 1903; Bolivia (AL)

Léveillé, A. 1910: 10 (*Temnochila*)

borrei Reitter, 1875; Antilles, Colombia (AL)
Léveillé, A. 1910: 10 (*Temnochila*)
brevior Léveillé, 1889; Colombia (AL)
Léveillé, A. 1910: 10 (*Temnochila*)
caerulea Olivier, 1790; South Europe, Southwestern Asia, North Africa, China (JK)
Léveillé, A. 1910: 10. Bahillo de la Puebla P. & López-Colón, J. I. 1999: 13. Bahillo de la Puebla P. & López-Colón, J. I. 2004: 129. Borowiec, L. 1983: 10. Burakowski et al. 1986: 116. Crowson, R. A. 1972: 339 (*Trogossita*). Gobbi, G. 1983: 51 (*Temnochila*). Klausnitzer, B. 1976: 5 (*Temnochila*). Kolibáč, J. 1993a: 21 (*Temnochila*). Kolibáč, J. 1993b: 90 (*Temnochila*). Mitter, H. 1998: 560 (*Temnochila*). Kolibáč, J. 2005: 83 (redescription)
Kolibáč, J. 2007a: 36 (syn. *Temnoscheila gemella* Bedel, 1900; described as species; synonymized by Kolibáč 2007a); Algeria (JK)
Kolibáč, J. 2007a: 365 (syn. *Temnoscheila pini* Brullé, 1838); Canary Isl. (JK)
Kolibáč, J. 2007a: 365 (syn. *Temnoscheila rogenhoferi* Reitter, 1875) „India or." (JK)
Klausnitzer, B. 1978: 176 (*Temnochila*). Léveillé, A. 1910: 11 (*Temnochila caerulea* var. *asiatica* Léveillé, 1908); Yunnan (AL)
Léveillé, A. 1910: 10 (syn. *Temnochila rogenhoferi* Reitter, 1875)
Léveillé, A. 1910: 11 (*Temnochila* var. *gemella* Bedel, 1900) Algeria (AL)
Mamaev, B. M. 1976: 1655 (*Trogossita*) (larva). Pajares, J. A. et al. 2004: 633 (biology). Whitehouse, N. J. 1997: 293 (biology). Vogt, H. 1967: 15 (*Temnochila*)
caerulea pini Brullé, 1838; Canary Isl. (varA)
Plata-Negrache, P. & C. Prendes-Ayala 1981: 226
chalcea Kirsch, 1873; Peru, America centr. (AL)
Léveillé, A. 1910: 10
championi Sharp, 1891; America centr. (AL)
Léveillé, A. 1910: 10
chevrolati Reitter, 1875; Brazil: „Cayenna", America centr. (AL)
Léveillé, A. 1910: 10
chiriquensis Sharp, 1891; Panama (AL)
Léveillé, A. 1910: 10
chlorodia Mannerheim, 1843; Western USA, Western Canada (JRB)
Barron, J. R. 1971: 82 (syn. *Temnochila prosternalis* Schaeffer, 1918; synonymized by Barron 1971). Barron, J. R. 1971: 82 (syn. *Temnochila virescens chlorodia* ab. *melanica* Hatch, 1962). Barron, J. R. 1971: 82 (syn. *Temnochila viridicyanea* Mannerheim, 1843; synonymized by whom, Reitter 1875?). Barron, J. R. 1971: 82 (syn. *Temnochila virescens chlorodia* Mannerheim, 1843: Schaeffer 1918, 1920; Hatch 1962; Struble and Carpelan 1941)
Boone, C. K. S. et al. 2008: 411 (biology). Dahlsten, D. L. et al. 2004: 1554 (biology). DeMars, C. J. Jr. et al. 1986: 881 (biology). Dominguez-Sanchez, B. et al. 2008: 175 (biology). Gaylord, M. L. W. et al. 2008: 57 (biology). Goheen, D. J. et al. 1985: 1535 (biology). Fettig, Ch. J. & Dabney, Ch. P. 2006: 75 (biology). Fettig, Ch. J. et al. 2004: 490 (biology). Fettig, Ch. J. et al. 2005: 748 (biology).

Fettig, Ch. J. et al. 2007: 141 (biology). Léveillé, A. 1910: 13 (*T. virescens*). Marsden, M. A. et al. 1981: 1 (biology). Miller, D. R. et al. 1997: 2013 (biology). Ross, D. W. & Daterman, G. E. 1998: 500 (biology). Swezey, S. L. & Dahlsen, D. L. 1982: 142 (biology). Williams, K. K. et al. 2009: 351 (biology). Zhou, J. et al. 2001: 993 (biology)

chrysosterna Reitter, 1875; Brazil: „Cayenna" (AL)
Léveillé, A. 1910: 10

colossus Serville, 1828; Colombia, Brazil: „Cayenna" (AL)
Léveillé, A. 1910: 11

corinthia Reitter, 1875; Mexico (AL)
Léveillé, A. 1910: 11

costaricensis Sharp, 1891; Costarica (AL)
Léveillé, A. 1910: 11

curta Léveillé, 1889; Cayenna (AL)
Léveillé, A. 1910: 11

davidi Léveillé, 1898; Ecuador (AL)
Léveillé, A. 1910: 11

dendrobia Gistl & Bromme, 1850; Colombia (AL)
Léveillé, A. 1910: 11

derasa Sharp, 1891; Mexico, Guatemala (AL)
Léveillé, A. 1910: 11

diffinis Sharp, 1891; Mexico (AL)
Léveillé, A. 1910: 11

digitata Sharp, 1891; America centr. (AL)
Léveillé, A. 1910: 11

doumerci Serville, 1828; Brazil: „Cayenna" (AL)
Léveillé, A. 1910: 11

dryadis Reitter, 1875; Mexico (AL)
Léveillé, A. 1910: 11

ebenina Blanchard, 1875; Bolivia, Uruguay (AL)
Léveillé, A. 1910: 11

edendata Schaeffer, 1918; USA: Arizona, California, Mexico: Baja (JRB)
Barron, J. R. 1971: 76 (syn. *Temnochila sonorana* Barrett, 1932: 171; synonymized by Barron 1971)
Schaeffer, C. F. A. 1918: 194

exarata Sharp, 1891; Mexico (AL)
Léveillé, A. 1910: 11

festiva Serville, 1828; Brazil (AL)
Léveillé, A. 1910: 11 (syn. *Temnochila splendens* Gray in Griffith 1832 (*Temnoscheila*); synonymized by whom?)

foveicollis Reitter, 1875; Brazil: „Cayenna", „Para" (AL)
Léveillé, A. 1910: 11

fraudulenta Sharp, 1891; Mexico (AL)
Léveillé, A. 1910: 11

fulgidovittata Blanchard, 1875; Bolivia (AL)
Léveillé, A. 1910: 11
geminata Sharp, 1891; Panama (AL)
Léveillé, A. 1910: 11
gigantea Reitter, 1875; Brazil (AL)
Léveillé, A. 1910: 11
gloriosa Reitter, 1875; Colombia (AL)
Léveillé, A. 1910: 11
grandis Sharp, 1891; Guatemala (AL)
Léveillé, A. 1910: 11
grilloi Léveillé, 1905; Brazil: „Paraná“ (AL)
Léveillé, A. 1910: 11
grouvellei Léveillé, 1889; America centr. (AL)
Léveillé, A. 1910: 12
guatemalana Sharp, 1891; America centr. (AL)
Léveillé, A. 1910: 12
hubbardi Léveillé, 1889; USA: Florida (JRB)
Léveillé, A. 1910: 12. Barron, J. R. 1971: 75
insignis Reitter, 1875; Colombia (AL)
Léveillé, A. 1910: 12. Reitter, E. 1875: 10 (homonym with *Temnoscheila insignis* Heer, 1868)
†*insignis* Heer, 1868 (*Trogosita*); Tertiary: Eocene; Greenland (JRB)
Barron, J. R. 1971: 120
iris Reitter, 1875; America centr. (AL)
Léveillé, A. 1910: 12
jansoni Léveillé, 1889; Brazil: “Minas Geraes” (AL)
Léveillé, A. 1910: 12
japonica Reitter, 1875; Japan, North Korea, Russian Far East, Northeastern China (JK)
Léveillé, A. 1910: 12. Esaki, T. et al. 1951: 1060. Inouye, M. & Nobuchi, A. 1957: 194 (*Temnochila*) (larva). Klausnitzer, B. 1996: 146 (larva). Kolibáč, J. 2007a: 365. Mamaev, B. M. 1976: 1655 (*Trogossita*) (larva). Nakane, T. K. et al. 1963: 181. Nikitsky, N. B. 1992: 80
jekeli Reitter, 1875; Colombia (AL)
Léveillé, A. 1910: 12 (syn. *Temnochila sennevillei* Léveillé, 1878)
kirschi Reitter, 1875; Colombia: Bogota (AL)
Léveillé, A. 1910: 12
laevicollis Reitter, 1875; Brazil: „Cayenna“ (AL)
Léveillé, A. 1910: 12
laticollis Reitter, 1875; Mexico (AL)
Léveillé, A. 1910: 12
lebasi Reitter, 1875; Colombia (AL)
Léveillé, A. 1910: 12
leveillei Sharp, 1891; Panama (AL)
Léveillé, A. 1910: 12

lucens Reitter, 1875; Brazil (AL)
Léveillé, A. 1910: 12
metallica Percheron, 1835?; Mexico (AL)
Léveillé, A. 1910: 12 (syn. *Temnochila mexicana* Reitter, 1875; synonymized by Salle 1877)
mirabilis Reitter, 1875; Colombia (AL)
Léveillé, A. 1910: 12
miranda Sharp, 1891; Mexico (AL)
Léveillé, A. 1910: 12
nigritarsis Léveillé, 1889; Brazil (AL)
Léveillé, A. 1910: 12
obscura Reitter, 1875; North America? (AL)
Léveillé, A. 1910: 12
obsoleta Reitter, 1875; Mexico (AL)
Léveillé, A. 1910: 12
obtusicollis Reitter, 1875; Venezuela (AL)
Léveillé, A. 1910: 12
olivacea Reitter, 1875; Colombia (AL)
Léveillé, A. 1910: 12
olivicolor Léveillé, 1889; Ecuador (AL)
Léveillé, A. 1910: 12
omolopha Barron, 1971; USA: Arizona, New Mexico (JRB)
Barron, J. R. 1971: 77
parva Léveillé, 1889; Santo Domingo (AL)
Léveillé, A. 1910: 12
patricioi Kirsch, 1881; „S. Thomé Isl." (AL)
Léveillé, A. 1910: 12
peruviana Léveillé, 1907; Peru (AL)
Léveillé, A. 1910: 12
planicollis Sharp, 1891; Guatemala (AL)
Léveillé, A. 1910: 12
planipennis Léveillé, 1889; Mexico (AL)
Léveillé, A. 1910: 12 (syn. *Temnochila metallica* Reitter, 1875; synonymized by whom?)
polita Chevrolat, 1833; America centr. (AL)
Léveillé, A. 1910: 12
pollens Sharp, 1891; Mexico (AL)
Léveillé, A. 1910: 12
polygonalis Léveillé, 1899; Brazil (AL)
Léveillé, A. 1910: 12
portoricensis Léveillé, 1907; Porto Rico (AL)
Léveillé, A. 1910: 12
praeterita Sharp, 1891; Mexico (AL)
Léveillé, A. 1910: 12

punctatissima Reitter, 1875; Brazil (AL)
Léveillé, A. 1910: 12
punicea Reitter, 1875; Brazil (AL)
Léveillé, A. 1910: 12
quadricollis Reitter, 1875; America centr. (AL)
Léveillé, A. 1910: 13
querula Sharp, 1891; America centr. (AL)
Léveillé, A. 1910: 13
reitteri Kirsch, 1885; Colombia (AL)
Léveillé, A. 1910: 13
reversa Sharp, 1891; Mexico (AL)
Léveillé, A. 1910: 13
rhyssa Barron, 1971; USA: California, Idaho (JRB)
Barron, J. R. 1971: 77
rugulosa Kirsch, 1873; Peru (AL)
Léveillé, A. 1910: 13
sallei Léveillé, 1889; Guatemala, Yucatan (AL)
Léveillé, A. 1910: 13
salvini Sharp, 1891; Panama (AL)
Léveillé, A. 1910: 13
sculpturata Reitter, 1875; Colombia (AL)
Léveillé, A. 1910: 13
sharpi Léveillé, 1894; Bogota (AL)
Léveillé, A. 1910: 13
smithi Sharp, 1891; Mexico (AL)
Léveillé, A. 1910: 13
splendida Gory, 1831; Brazil: Cayenna (AL)
Léveillé, A. 1910: 13
steinheili Reitter, 1875; Colombia (AL)
Léveillé, A. 1910: 13
stipes Sharp, 1891; Mexico (AL)
Léveillé, A. 1910: 13
subcylindrica Léveillé, 1907; Brazil (AL)
Léveillé, A. 1910: 13
sulcifrons Sharp, 1891; America centr. (AL)
Léveillé, A. 1910: 13
sulcisternum Léveillé, 1889; Jamaica (AL)
Léveillé, A. 1910: 13
suturata Reitter, 1875; Mexico, Brazil (AL)
Léveillé, A. 1910: 13
telemanensis Sharp, 1891; Guatemala (AL)
Léveillé, A. 1910: 13

tristis Mulsant & Rey, 1853; Italia, Argentina, Colombia, Brazil (JK)
Léveillé, A. 1910: 13 (syn. *Temnochila cribricollis* Reitter, 1875; synonymized by whom?). Kolibáč, J. 2007a: 365
urbensis Sharp, 1891; Mexico (AL)
Léveillé, A. 1910: 13
varians Guérin, 1846; Brazil: Cayenna (AL)
Léveillé, A. 1910: 13
variicolor Léveillé, 1889; Colombia (AL)
Léveillé, A. 1910: 13
virescens Fabricius, 1775; Guayana, Central America, USA, introduced to Australia (varA)
Léveillé, A. 1910: 13. Abbott, I. 1993: 35 (biology). Barron, J. R. 1971: 79. Barron, J. R. 1971: 80 (syn. *Temnochila cyanea* Reitter, 1875; syn. by Léveillé, 1888). Barron, J. R. 1971: 80 (syn. *Temnochila cyanea* Reitter, 1875; may be synonym of *T. chlorodia*! Note Barron 1971). Billings, R. F. 1985: 483 (biology). Billings, R. F. & Cameron, R. S. 1984: 1542 (biology). Böving, A. G. & Craighead, F. C. 1931: 273 (larva). Klausnitzer, B. 1978: 176. Klausnitzer, B. 1996: 146 (larva). Lawson, S. A. & Morgan, F. D. 1992: 225 (biology). Lawson, S. A. & Morgan, F. D. 1993: 139 (biology). Massey, C. L. et al. 1977: 1 (biology). Matthews, E. G. 1992: 3. McCravy, K. W. et al. 2000: 77 (biology). Page, J. M. 1981: 217 (biology). Reeve, J. D. S. et al. 2009: 183 (biology)
yuccae Crotch, 1874; USA: California, Nevada; Mexico: Baja (JRB)
Léveillé, A. 1910: 13. Barron, J. R. 1971: 74
Temnoscheila sp
Beutel, R. G. & Ślipiński, S. A. 2001: 219 (phylogeny, morphology). Costa, C. et al. 1988: 177 (larva)

Genus *Tenebroides* Piller & Mitterpacher, 1783

http://species-id.net/wiki/Tenebroides
Figs 2, 8; Map 5

Piller, M. & Mitterpacher, L. 1783: 87.

Type species. *Tenebrio mauritanicus* Linnaeus, 1758 [designated by Westwood 1838]
Léveillé, A. 1910: 14. Barron, J. R. 1971: 88. Crowson, R. A. 1964a: 299. Downie, N. M. & Arnett, R. H. Jr. 1996: 937 (key). Kobayashi, K. 1980: 1–6 (ecology). Kolibáč, J. 2005: 84 (redescription). Kolibáč, J. 2006: 111 (phylogeny). Kolibáč, J. et al. 2005: 30 + 134 (key). Mamaev, B. M. 1976: 1652 (larva). Matthews, E. G. 1992: 3. Merkl, O. 1993: 12 (key). Nikitsky, N. B. 1992: 80. Ratti, E. 1997: 178 (*Tenebroides* sp.). Reitter, E. 1876: 28. Spahr, U. 1981: 74 (amber and copal fossils). Uchida, A. 1980: 61–73 (biology).
Trogossita Olivier, 1790 [type species: *Trogossita caerulea* Olivier, 1790]
Barron, J. R. 1971: 88 (list of references).

Description. Body size: about 3.5–12.0 mm. Body shape elongate. Gular sutures wide, convergent at apex. Frontoclypeal suture absent. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides present. Submentum: ctenidium absent. Antennal groove present. Eyes: size flat. Eyes number: two. Epicranial acumination moderate. Lacinial hooks absent. Galea: shape elongate. Galea: ciliate setae present. Mediostipes-Lacinia fused together. Palpifer: outer edge denticulate. Mandibular apical teeth number: two, horizontally situated. Mola absent. Penicillus (at base) present (fine, often membranous). Pubescence above mola or cutting edge absent. Ventral furrow present. Basal notch moderate. Labrum-Cranium not fused. Epipharyngial sclerite present. Lateral tormal process: projection curved downwards, processes not connected (*Airora*). Ligula: ciliate setae present. Ligula rigid, weakly retroflexed, weakly emarginate. Hypopharyngeal sclerite consisting of two separate parts. Antenna 11-segmented. Antennal club asymmetrical, sensorial fields present. Front coxal cavities externally closed, internally open. Pronotum transverse. Prepectus absent. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron moderate. Elytral interlocking mechanism present, carinae reduced. Elytral punctation regular, scales absent. Wing: radial cell open (outer vein present), wedge cell absent, cross vein MP3-4 absent, cross vein AA1+2-3+4 absent. Front tibiae: spines along side moderate. Hooked spur present. Claws: denticle absent. Spiculum gastrale absent. Tegmen composed of three parts. Coxitae undivided.

Larva: Frontal arms V-shaped. Epicranial stem reduced. Endocarina present. Gular sutures conspicuous, parallel. Gula: anterior apodemes absent. Paragular sclerites present. Hypostomal rods absent. Stemmata number: five. Mandibular apical teeth number: two, horizontally situated. Lacinia mandibulae with several small spines. Mola absent. Maxillary palpi 3-segmented. Palpifer absent. Pedunculate seta present. Mala simple. Mala: bidentate protrusion absent. Cardo-Stipes partially fused. Cardo: size much smaller than stipes. Ligula present. Labial palpi 2-segmented. Prementum in single part, anterior margin with notch. Torma: two separate lateral sclerites. Antennal joints 1 and 2 elongate. Sensory appendix medium sized (to half of joint 3). Thoracic sclerites pattern (dorsally) 1-2-2. Thoracic sclerites pattern (ventrally) 3+1+1. Trochanter oblong. Abdominal segment IX not divided. Tergite IX flat. Urogomphi present, hooked; median process absent.

Biology. The species of the genus are mostly predatory, occasionally feeding on grains (e.g. the cadelle beetle, *Tenebroides mauritanicus*, which is adapted to a synanthropic way of life and is a serious pest of stored grain). It is probably originally European. The wild population, sometimes designated as the separate species *T. fuscus* Goeze, 1777, lives in forests and its adults and larvae may be found under the bark of deciduous trees, where they feed on other insects. Supposed differences between adults of the both species can be summarized as follows: (1) *T. fuscus* – antennae dilated from antennomere 6; elytra weakly glabrous, densely transversely wrinkled; frons narrower than that in the following species. (2) *T. mauritanicus* – antennae dilated from antennomere 8; elytra rather dull, sparsely transversely wrinkled; frons wider than that in *T. fuscus*.

Distribution. The bulk of species is distributed in the two Americas. Only a few species live in the Palaearctic region. Synanthropic *T. mauritanicus* is cosmopolitan.

Species:

aenelpennis Reitter, 1875; Brazil (AL)
Léveillé, A. 1910: 14

aeneus Reitter, 1875; Colombia (AL)
Léveillé, A. 1910: 14

albomaculatus Reitter, 1875; Colombia, America centr. (AL)
Léveillé, A. 1910: 14

albonotatus Reitter, 1875; Brazil: Cayenna (AL)
Léveillé, A. 1910: 15

alticola Sharp, 1891; Guatemala (AL)
Léveillé, A. 1910: 15

alutaceus Léveillé, 1905; Brazil (AL)
Léveillé, A. 1910: 15

americanus Kirby, 1837; USA, Canada (JRB)
Léveillé, A. 1910: 15 (syn. *Tenebroides castaneus* Melsheimer, 1844; synonymized by LeConte 1863). Barron, J. R. 1971: 103 (syn. *Trogosita castanea* Melsheimer, 1844). Barron, J. R. 1971: 103 (syn. *Trogosita nigrita* Horn, 1862; synonymized by LeConte 1863)

anceps Léveillé, 1889; America centr. (AL)
Léveillé, A. 1910: 15

antennalis Reitter, 1875; Colombia (AL)
Léveillé, A. 1910: 15

auriculatus Sharp, 1891; Guatemala (AL)
Léveillé, A. 1910: 15

australis Boisduval, 1835; Tasmania (?) (AL)
Léveillé, A. 1910: 15

bimaculatus Melsheimer, 1844; USA, „Pennsylvania“(JRB)
Léveillé, A. 1910: 15. Barron, J. R. 1971: 102

bipustulatus Fabricius, 1801; Brazil: Cayenna (AL)
Léveillé, A. 1910: 15 (syn. var. *impressifrons* Reitter, 1875: “Amer. mer.”; syn. n.)

boggianii Léveillé, 1905; Paraguay (AL)
Léveillé, A. 1910: 15

bonvouloiri Léveillé, 1889; Mexico (AL)
Léveillé, A. 1910: 15 (var. *chontalensis* Sharp, 1891: Nicaragua; syn. n.)

brevis Léveillé, 1889; Brazil (AL)
Léveillé, A. 1910: 15

breviusculus Reitter, 1875; America centr., Brazil (AL)
Léveillé, A. 1910: 15

brunneovittatus Léveillé, 1894; America centr., Brazil (AL)
Léveillé, A. 1910: 15

brunneus Léveillé, 1889; Brazil: Cayenna (AL)
Léveillé, A. 1910: 15
bugnioni Léveillé, 1903; Colombia (AL)
Léveillé, A. 1910: 15
carbonarius Léveillé, 1889; Brazil: Cayenna (AL)
Léveillé, A. 1910: 15
carinatus Léveillé, 1894; Brazil (AL)
Léveillé, A. 1910: 15
celatus Sharp, 1891; America centr. (AL)
Léveillé, A. 1910: 15
chevrolati Reitter, 1875; Mexico (AL)
Léveillé, A. 1910: 15
circumcinctus Léveillé, 1889; America centr. (AL)
Léveillé, A. 1910: 15
collaris Sturm, 1807; Canada: Ontario, E USA to Michigan and E Texas (JRB)
Léveillé, A. 1910: 15 (syn. *Tenebroides nigripennis* Sturm, 1826). Barron, J. R. 1971: 97 (*Trogosita nigripennis* Sturm, 1826; *nomen nudum*). Barron, J. R. 1971: 97 (*Trogosita nigripennis* Dejean, 1836; *nomen nudum*)
complicatus Sharp, 1891; America centr. (AL)
Léveillé, A. 1910: 15
cordicollis Léveillé, 1889; Brazil (AL)
Léveillé, A. 1910: 15
† *corrugata* Wickham, 1913; USA: Colorado, Florissant; Early Oligocene (JRB)
Barron, J. R. 1971: 120. Ponomarenko, A. G. & Kireichuk, A. G. 2005–2008: http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm. Schmied, H. et al. 2009: 23. Wickham, H. F. 1913: 291
corticalis Melsheimer, 1844; Guatemala, Mexico, USA, Canada to Alaska (JRB)
Léveillé, A. 1910: 15 (syn. *Tenebroides dubius* Melsheimer, 1844; synonymized by Barron 1971). Léveillé, A. 1910: 16 (syn. *Tenebroides intermedius* Horn, 1862; synonymized by Barron 1971). Léveillé, A. 1910: 17 (syn. *Tenebroides limbalis* Melsheimer, 1844; synonymized by Barron 1971). Barron, J. R. 1971: 115 (syn. *Trogosita limbalis* Melsheimer, 1844; synonymized by LeConte 1863). Barron, J. R. 1971: 115 (syn. *Trogosita dubia* Melsheimer, 1844; synonymized by LeConte 1863). Barron, J. R. 1971: 115 (*Trogosita conformis* Dejean, 1836; *nomen nudum*). Barron, J. R. 1971: 115 (syn. *Trogosita intermedia* Horn, 1862; synonymized by LeConte 1863)
crassicornis Horn, 1862; Western states of Canada, USA (JRB)
Léveillé, A. 1910: 15. Barron, J. R. 1971: 95 (syn. *Trogosita californica* Horn, 1862; synonymized by LeConte 1863). Barron, J. R. 1971: 95 (syn. *Trogosita pleuralis* Horn, 1862; synonymized by LeConte 1863). Léveillé, A. 1910: 18. (*Tenebroides pleuralis* Horn, 1862: California)
cribratus Léveillé, 1894; Mexico (AL)
Léveillé, A. 1910: 15

cucujoides Reitter, 1875; Colombia (AL)
Léveillé, A. 1910: 15
delicatus Léveillé, 1899; Brazil (AL)
Léveillé, A. 1910: 16
depressior Palisot de Beauvois, 1811 (*Trogossita*) incertae sedis; N America (JRB)
Léveillé, A. 1910: 16. Barron, J. R. 1971: 119 (*Trogossita depressior* Palisot de Beauvois, 1811; *incertae sedis*)
depressus Guérin, 1846; Brazil, America centr. (AL)
Léveillé, A. 1910: 16
difficilis Léveillé, 1889; Honduras (AL)
Léveillé, A. 1910: 16
dilatatus Erichson, 1847; Peru (AL)
Léveillé, A. 1910: 16
donckieri Léveillé, 1902; Brazil (AL)
Léveillé, A. 1910: 16
elongatulus Jacquelin du Val,1857; Cuba (AL)
Léveillé, A. 1910: 16
†*emortua* Germar, 1849; Germany: Orsberg; Tertiary: Upper Oligocene (varA)
Mörs, T. 1995: ii. Ponomarenko, A. G. & Kireichuk, A. G. 2005–2008: http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm. Schmied, H. et al. 2009: 23
† *eocenica* Meunier, 1921; Germany: Messel; Tertiary: middle Eocene (varA)
Meunier, F. 1921: ii. Ponomarenko, A. G. & Kireichuk, A. G. 2005–2008: http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm. Schmied, H. et al. 2009: 23
excellens Sharp, 1891; Panama (AL)
Léveillé, A. 1910: 16
explanatus Reitter, 1875; Colombia (AL)
Léveillé, A. 1910: 16
facilis Sharp, 1891; Mexico (AL)
Léveillé, A. 1910: 16
farmairei Léveillé, 1889; Tonga-Tabu (AL)
Léveillé, A. 1910: 16
fenestratus Léveillé, 1889; Mexico (AL)
Léveillé, A. 1910: 16
flaviclavis Reitter, 1875; Cuba (AL)
Léveillé, A. 1910: 16
floridanus Schaeffer, 1918; USA: Florida, Louisiana, centr. America (JRB)
Barron, J. R. 1971: 111. Schaeffer, C. F. A. 1918: 199
fossulatus Léveillé, 1899; Bolivia (AL)
Léveillé, A. 1910: 16
fryi Léveillé, 1898; Brazil (AL)
Léveillé, A. 1910: 16
fulgens Sharp, 1891; Panama (AL)
Léveillé, A. 1910: 16

fulvolineatus Léveillé, 1889; Brazil (AL)
Léveillé, A. 1910: 16
germaini Léveillé, 1895; Bolivia (AL)
Léveillé, A. 1910: 16
godmani Sharp, 1891; Panama (AL)
Léveillé, A. 1910: 16
gounellei Léveillé, 1889; Brazil: "Minas Geraes" (AL)
Léveillé, A. 1910: 16
gracilipes Sharp, 1891; Panama (AL)
Léveillé, A. 1910: 16
harpaloides Léveillé, 1889; Mexico (AL)
Léveillé, A. 1910: 16
helophorus Sharp, 1891; Mexico (AL)
Léveillé, A. 1910: 16
humeralis Léveillé, 1889; Colombia (AL)
Léveillé, A. 1910: 16
importunus Léveillé, 1905; Brazil (AL)
Léveillé, A. 1910: 16
incertus Léveillé, 1889; Mexico (AL)
Léveillé, A. 1910: 16
†*insignis* Heer, 1883; Greenland: Atanrkerdluk; Mesozoic: Upper Cretaceous, Maastrichtian (varA)
Ponomarenko, A. G. & Kireichuk, A. G. 2005–2008: http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm. Schmied, H. et al. 2009: 23
insinuans Walker, 1858; Ceylon (?) (AL)
Léveillé, A. 1910: 16
instabilis Sharp, 1891; Mexico (AL)
Léveillé, A. 1910: 16
iteratus Sharp, 1891; Mexico (AL)
Léveillé, A. 1910: 16
jatahyensis Léveillé, 1902; Brazil (AL)
Léveillé, A. 1910: 16
latens Wollaston, 1862; Canary Isl: Teneriffa (JK)
Léveillé, A. 1910: 16. Kolibáč, J. 2007a: 365. Plata-Negrache, P. & Prendes-Ayala, C. 1981: 230
laticollis Horn, 1862; Eastern USA, Canada (JRB)
Léveillé, A. 1910: 16. Barron, J. R. 1971: 105 (syn. *Trogosita obscura* Horn, 1862; synonymized by LeConte 1863)
latus Léveillé, 1889; Mexico (AL)
Léveillé, A. 1910: 17
lineolatus Reitter, 1877; Colombia (AL)
Léveillé, A. 1910: 17

litigiosus Reitter, 1875; Brazil (AL)
Léveillé, A. 1910: 17
longicornis Léveillé, 1889 – Brazil (AL)
Léveillé, A. 1910: 17
longulus Sharp, 1891; Guatemala (AL)
Léveillé, A. 1910: 17
lucidus Sharp, 1891; Panama (AL)
Léveillé, A. 1910: 17
marginatus Palisot de Beauvois, 1811; S and middle E USA (JRB)
Léveillé, A. 1910: 17. Barron, J. R. 1971: 99 (syn. *Tenebroides cucujiformis* Horn, 1862; synonymized by LeConte 1863). Barron, J. R. 1971: 99. Léveillé, A. 1910: 15 (*Tenebroides cucujiformis* Horn, 1862). Léveillé, A. 1910: 16 (homonym *T. marginatus* Latreille, 1833 replaced by *T. latreillei* Léveillé, 1889: "Amer. aequin."; synonymized by Barron 1971?)
marginicollis Sharp, 1891; Guatemala (AL)
Léveillé, A. 1910: 17
maroccanus Reitter, 1884; N Africa, Azores, Corsica, Spain (JK)
Léveillé, A. 1910: 17 (var. *baillioti* Léveillé, 1903: Madrid; syn. n.). Audisio, P. et al. 1995: 14. Kolibáč, J. 2007a: 365. Villemant, C. & Ramzi, H. 1997: 441 (biology)
marseuli Reitter, 1875; St. Catharina (AL)
Léveillé, A. 1910: 17
mauritanicus Linnaeus, 1758 (*Tenebrio*); cosmopolitan; type locality: "Algiriae" (varA) (syn. *Lucanus dubius* Scriba, 1790; *Carabus bucephalus* Herbst, 1783; *Lucanus fuscus* Goeze, 1777; *Lucanus fuscus* Preyssler, 1790; *Platycerus fuscus* Geoffroy, 1762; *Platycerus striatus* Fourcroy, 1785; *Tenebrio caraboides* Linnaeus, 1758: type locality: "Europa"; *Tenebrio piceus* Schaller, 1783; *Tenebrio planus* Quensel, 1790; *Tenebroides complanatus* Piller & Mitterpacher, 1783; *Tenebrio piceus* Schaller, 1783; *Trogosita affinis* White, 1846)
Léveillé, A. 1910: 17 (syn. *Tenebrioides fuscus* Goeze, 1777). Léveillé, A. 1910: 17 (var. *nitidus* Horn, 1862: 83 synonymized by Kolibáč 2007). Arbogast, R. T. & Byrd, R. V. 1982: 61 (biology). Audisio, P. et al. 1995: 14 (*Tenebroides fuscus* Goeze, 1777). Bahillo de la Puebla P. & López-Colón, J. I. 1999: 13. Bahillo de la Puebla P. & López-Colón, J. I. 1999: 13 (*Tenebroides fuscus* Goeze, 1777). Bahillo de la Puebla P. & López-Colón, J. I.2004: 129. Bahillo de la Puebla P. & López-Colón, J. I. 2004: 129 (*Tenebroides fuscus* Goeze, 1777). Barron, J. R. 1971: 92–93. Barron, J. R. 1971: 93 (syn. *Trogosita nitida* Horn, 1862; synonymized by LeConte 1863). Borowiec, L. 1983: 11. Borowiec, L. 1983: 11 (*Tenebroides fuscus* Goeze, 1777). Burakowski, B. et al. 1986: 117. Burakowski, B. et al. 1986: 117 (*Tenebroides fuscus* Goeze, 1777). Dziadik-Turner, C. et al. 1981: 546 (biology). Esaki, T. et al. 1951: 1061. Faustini, D. I. & D. G. H. Halstead 1982: 45. Gollkowski, V. 1988: 42. Herger, P. 1998: 105 (*Tenebroides fuscus* Goeze, 1777; distribution). Holzer, E. 1995: 30. Huber, Ch. & Kobel, E. 1994: 1. Kampsu, G. 2005: 17 (biology). Klausnitzer, B. 1976: 8. Klausnitzer, B. 1976: 8 (*Tenebrio-*

ides fuscus Goeze, 1777). Klausnitzer, B. 1978: 176. Klausnitzer, B. 1996: 146. Klausnitzer, B. 1996: 151 (*Tenebroides fuscus* Goeze, 1777). Kolibáč, J. 1993a: 21. Kolibáč, J. 1993a: 21 (*Tenebroides fuscus* Goeze, 1777). Kolibáč, J. 1993b: 90. Kolibáč, J. 1993b: 90 (syn. *Tenebroides fuscus* Goeze, 1777). Kolibáč, J. 1996b: 473. Kolibáč, J. 1999b: 12. Kolibáč, J. 2005: 84 (redescription). Kolibáč, J. 2006: 109 (*Tenebroides fuscus* Goeze, 1777; larva). Kolibáč, J. 2007a: 365 (*Tenebroides fuscus* Goeze, 1777). Kolibáč, J. 2007a: 365 (syn. *Tenebroides nitidus* Horn, 1862). Kolibáč, J. 2007a: 365. Kolibáč, J. 2007a: 365 (syn. *Tenebroides piceus* Dalla Torre, 1879). Mamaev, B. M. 1976: 1654. Matthews, E. G. 1992: 3. Mitter, H. 1998: 560. Mitter, H. 1998: 560 (*Tenebroides fuscus* Goeze, 1777). Nakane, T. et al. 1963: 181. Nikitsky, N. B. 1992: 80. Pileckis, S. & V. Monsevičius 1995: 272. Plata-Negrache, P. & Prendes-Ayala, C. 1981: 230. Pospischil, R. 2003: 4 (biology). Purrini, K. & Ormieres, R. 1979: 437. Ratti, E. 1997: 178. Šefrová, H. & Laštůvka, Z. 2005: 162. Szwalko, P. & Kubisz, D. 1994: 46 (*Tenebroides fuscus* Goeze, 1777; distribution). Teson, A. & Dagoberto, E. L. 1979: 127 (biology). Vogt, H. 1967: 16. Vogt, H. 1967: 16 (*Tenebroides fuscus* Preyssler, 1790). Leschen, R. A. B. & Lackner, T. 2013: 301 (syn. *Trogosita affinis* White, 1846; New Zealand)

metallescens Reitter, 1875

Léveillé, A. 1910: 18; Brazil (AL)

moerens Sharp, 1891; Panama (AL)

Léveillé, A. 1910: 18

mordax Sharp, 1891; Costarica (AL)

Léveillé, A. 1910: 18

murinus Reitter, 1875; Colombia (AL)

Léveillé, A. 1910: 18

muticus Palisot de Beauvois, 1811 (*incertae sedis*); N America (JRB)

Léveillé, A. 1910: 18. Léveillé, A. 1888: 439 (syn. *Trogosita punctata* Dejean, 1836). Barron, J. R. 1971: 120 (*Trogosita punctata* Dejean, 1836; nomen nudum). Barron, J. R. 1971: 119. (incertae sedis, syn. with *T. nanus* Melsheimer, 1844 by Horn 1862)

nanus Melsheimer, 1844; E USA, Mexico (JRB)

Léveillé, A. 1910: 18. Barron, J. R. 1971: 98. Barron, J. R. 1971: 119. (syn. *T. muticus* Palisot de Beauvois, 1811 syn. by Horn 1862). Klausnitzer, B. 1996: 150. Kolibáč, J. 2006: 109

nemosomiaeformis Léveillé, 1905; Brazil (AL)

Léveillé, A. 1910: 18

nigrocyaneus Léveillé, 1905; Paraguay (AL)

Léveillé, A. 1910: 18

nigroviridis Léveillé, 1889; Mexico (AL)

Léveillé, A. 1910: 18

oblongus Sharp, 1891; Mexico, Panama (AL)

Léveillé, A. 1910: 18

obtusus Horn, 1862; Eastern coastal states of USA (JRB)
Léveillé, A. 1910: 18. Barron, J. R. 1971: 108
occidentalis Fall, 1910; W Canada and USA, Mexico (JRB)
Barron, J. R. 1971: 117. Fall, H. C. 1910: 128
ocularis Lewis, 1894; Japan (AL)
Léveillé, A. 1910: 18
opacus Reitter, 1875 (incertae sedis); N America (?), Colombia (JRB)
Léveillé, A. 1910: 18. Barron, J. R. 1971: 120 (incertae sedis)
ornatus Léveillé, 1889; Brazil (AL)
Léveillé, A. 1910: 18
passeti Léveillé, 1905; Brazil (AL)
Léveillé, A. 1910: 18
patruelis Reitter, 1875 (incertae sedis); Brazil, "Carol. mer." (JRB)
Léveillé, A. 1910: 18. Barron, J. R. 1971: 120 (incertae sedis)
politus Sharp, 1891; Guatemala (AL)
Léveillé, A. 1910: 18
pollens Sharp, 1891; America centr. (AL)
Léveillé, A. 1910: 18
pulchellus Reitter, 1875; "Nov. Grenada" (AL)
Léveillé, A. 1910: 18
pumilus Léveillé, 1889; Colombia (AL)
Léveillé, A. 1910: 18
punctatolineatus Fairmaire, 1850; Polynesia (?) (AL)
Léveillé, A. 1910: 18
punctulatus Reitter, 1875; Cuba, Portorico (AL)
Léveillé, A. 1910: 18
pusillimus Mannerheim, 1843 (incertae sedis); USA: Alaska (JRB)
Léveillé, A. 1910: 18. Barron, J. R. 1971: 120 (incertae sedis)
quadridens Palisot de Beauvois, 1811; "Oware" (?) (AL)
Léveillé, A. 1910: 18
quadriguttatus Reitter, 1875; Brazil, Argentina (AL)
Léveillé, A. 1910: 18
rectus Wollaston, 1862; Canary Isl.: Lanzarote (JK)
Léveillé, A. 1910: 18. Kolibáč, J. 2007a: 365. Plata-Negrache, P. & Prendes-Ayala, C. 1981: 230
reflexus Reitter, 1875; Colombia (AL)
Léveillé, A. 1910: 18
reitteri Léveillé, 1889; Panama, Brazil (AL)
Léveillé, A. 1910: 18
repetitus Sharp, 1891; Mexico, Guatemala (AL)
Léveillé, A. 1910: 19
ritsemae Léveillé, 1889; Colombia, Costarica (AL)
Léveillé, A. 1910: 19

ruber Reitter, 1875; America centr., Brazil (AL)
Léveillé, A. 1910: 19
rubromarginatus Reitter, 1875; Brazil (AL)
Léveillé, A. 1910: 19
ruficollis Reitter, 1875; Bogota (AL)
Léveillé, A. 1910: 19
rufipes Léveillé, 1889; Brazil (AL)
Léveillé, A. 1910: 19
rufiventris Reitter, 1875; Colombia, Argentina (AL)
Léveillé, A. 1910: 19
rufolimbatus Léveillé, 1889; Mexico (AL)
Léveillé, A. 1910: 19
rugosipennis Horn, 1862; E USA to Arizona (JRB)
Léveillé, A. 1910: 19. Barron, J. R. 1971: 108 (syn. *Tenebroides arizonensis* Schaeffer, 1918; synonymized by Barron 1971)
sallei Sharp, 1891; Mexico (AL)
Léveillé, A. 1910: 19
scaberrimus Léveillé, 1905; Brazil (AL)
Léveillé, A. 1910: 19
schaufussi Reitter, 1875; Venezuela: Caracas (AL)
Léveillé, A. 1910: 19
sculpturatus Reitter, 1875; Brazil (AL)
Léveillé, A. 1910: 19
semicylindricus Horn, 1862; Eastern coast of USA to Mexico (JRB)
Barron, J. R. 1971: 109 (syn. *Tenebrioides subaenea* Reitter, 1875; synonymized by whom?). Barron, J. R. 1971: 109 (syn. *Tenebroides foveatus* Blatchley, 1917; synonymized by Barron 1971). Barron, J. R. 1971: 110 (syn. *Tenebroides helophorus* Sharp, 1891; synonymized by Schaeffer 1918; syn. uncertain)
semicylindricus Horn, 1862
Léveillé, A. 1910: 19
sennevillei Léveillé, 1889; America centr. (AL)
Léveillé, A. 1910: 19
sericatus Sharp, 1891; Guatemala (AL)
Léveillé, A. 1910: 19
serraticollis Léveillé, 1907; Argentina (AL)
Léveillé, A. 1910: 19
sharpi Léveillé, 1891; Panama (AL)
Léveillé, A. 1910: 19
Léveillé, A. 1910: 19 (syn. *Tenebroides bimaculatus* Sharp, 1891; syn by Léveillé 1910?) (AL)
similis Léveillé, 1905; Brazil
Léveillé, A. 1910: 19

sinuatus LeConte, 1861; W USA, Canada; to Kansas, Montana, Texas (JRB)
Léveillé, A. 1910: 19 (syn. *Tenebroides sinuatus* var. *californicus* Horn, 1862; synonymized by Barron 1971?). Barron, J. R. 1971: 91
sonorensis Sharp, 1891; SW USA, Mexico, Cuba (?) (JRB)
Léveillé, A. 1910: 19 (distribution in Cuba). Barron, J. R. 1971: 112 (syn. *Tenebroides debilis* Fall, 1910; synonymized by whom?). Dajoz, R. 1997: 42 (ecology)
soror Jacquelin du Val,1857; USA: Florida, Bahamas, N Cuba (JRB)
Léveillé, A. 1910: 19. Barron, J. R. 1971: 101
spectator Sharp, 1891; Guatemala (AL)
Léveillé, A. 1910: 19
steinheili Reitter, 1875; Colombia (AL)
Léveillé, A. 1910: 19
stultus Léveillé, 1907; Argentina (AL)
Léveillé, A. 1910: 19
sublaevis Palisot de Beauvois, 1811; 'Oware' (AL)
Léveillé, A. 1910: 19
Note: species not mentioned by Barron (1971)
subnigra Palisot de Beauvois, 1811 (incertae sedis); USA: Pennsylvania (JRB)
Léveillé, A. 1910: 19 (*Tenebroides subniger*; misspelling). Barron, J. R. 1971: 119 (incertae sedis)
subplanus Reitter, 1875; Mexico (AL)
Léveillé, A. 1910: 19
subruber Léveillé, 1899; Brazil (AL)
Léveillé, A. 1910: 19
subvirescens Léveillé, 1889; Brazil (AL)
Léveillé, A. 1910: 19
sulcifrons Jacquelin du Val,1857; Cuba (AL)
Léveillé, A. 1910: 19
†*tenebrioides* Germain, 1837; Germany: Rott, Siebengebirge; Tertiary: Upper Oligocene (varA)
Léveillé, A. 1910: 19. Ponomarenko, A. G. & Kireichuk, A. G. 2005–2008: http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm. Schmied, H. et al. 2009: 23
tenuistriatus Fall, 1910; USA: Colorado, New Mexico, Arizona; Mexico (JRB)
Barron, J. R. 1971: 114
transversicollis Jacquelin du Val,1857; Cuba (AL)
Léveillé, A. 1910: 20
turkestanicus Ballion, 1870; Central Asia (JK)
Léveillé, A. 1910: 20. Kolibáč, J. 2006: 109. Kolibáč, J. 2007a: 365. Mamaev, B. M. 1976: 1654 (larva)
undulatus Sharp, 1891; Guatemala (AL)
Léveillé, A. 1910: 20
viridescens Léveillé, 1889; Brazil (AL)
Léveillé, A. 1910: 20

yucatanicus Léveillé, 1889; Yucatan, Honduras (AL)
Léveillé, A. 1910: 20
zapotensis Sharp, 1891; Guatemala (AL)
Léveillé, A. 1910: 20
zunilensis Sharp, 1891; Guatemala (AL)
Léveillé, A. 1910: 20

† Genus *Thoracotes* Handlirsch, 1906

http://species-id.net/wiki/Thoracotes
Figs 24, 25; Map 5

Handlirsch, A. 1906–1908: 438–439, Taf. XLI-9 (1906).

Type species. *Thoracotes dubius* Handlirsch, 1906 [by monotypy]

Kolibáč, J. 2006: 121 (classification). Ponomarenko, A. G. 1985: 68. Ponomarenko, A. G. 1990: 74. Ponomarenko, A. G. & Kireichuk, A. G. 2005–2008: http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm. Schmied, H. et al. 2009: 24.

Description (*T. dubius*): "*Ein 8 mm langer Käfer von ähnlicher Gestalt wie* Parnidium *Geinitzi. Der Prothorax is aber anders geformt un nähert sich mehr der Kreisform, Auch der Kopf scheint anders gewesen zu sein. Flügeldecken punktiert, 3,5 mal so lang als breit. Geinitz vergleicht diese Form mit Latridiites Schaumi, mit dem sie allerdings auch einige Ähnlichkeit hat.*"

This is potentially the oldest fossil record of Trogossitidae. Unfortunately, its description is inadequate and the illustration very poor. It is unclear to me why two more Mesozoic species from Russia were assigned to this dubious genus. It was not indicated in the original papers describing the two new species if the type of *T. dubius* was studied *in situ* (Ponomarenko 1985, 1990). The specimen appears to be housed in Ernst Moritz Arndt University of Greifswald, Germany. (A facsimile of the original description and illustration in Figs 24, 25.)

Description (*T. glabrus*, translation from Russian). "*Head sligthtly longer than wide, narrowed in front of eyes; eyes relatively large, situated at sides of head; cheeks* [genae] *short; temples* [tempora] *slightly shorter than eyes. The first antennomere large, second transverse, third 1.5 times longer than second, fourth to seventh as long as wide, eighth longer than wide, nineth to eleventh asymmetric. Pronotum with lateral margins rounded, its corners not acute, 1.5 times longer than wide. Front coxae not large, spherical, with exposed trochantins. Prosternal process short and blunt. Middle coxae transverse, nearly touching each other. Metathorax trapezoidal, narrowed anteriad, its length 1.8 times lesser than wide at hind* [basal] *margin. Hind coxae touch each other, transverse, not concave posteriorly* [sic] *and without coxal plates, at lateral sides shorter than at mid-point. Last abdominal sternite distinctly longer than penultimate one. Ovipositor long, with sclerotized palpifers* [sic] *and pairs of appendages* [coxitae] *with pubescent cerci* [styli]. *Legs relatively long, tibiae and tarsi thin. Elytra smooth. Length of beetle 3.6, width 1.6; length of elytra 2.3 mm.*" "*The beetle of Pavlovka distinctly smaller (length 3.0, width 1.0 mm).*" (Ponomarenko 1990: 74.)

Distribution. Germany: Dobbertin in Mecklenburg, Russia: central Siberia; Transbaikalia: Pavlovka, Onokhoy; Mesozoic: from Lower to Upper Jurassic.

Species:

† *dubius* Handlirsch, 1906; Germany; Lower Jurassic: Upper Lias (varA)
Kolibáč, J. 2006: 121 (classification). Schmied, H. et al. 2009: 24

† *glabrus* Ponomarenko, A., 1990; Russia: Transbaikalia; Upper Jurassic (varA)
Ponomarenko, A. G. 1990: 74. Kolibáč, J. 2006: 121. Ponomarenko, A. G. & Kireichuk, A. G. 2005–2008: http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm. Schmied, H. et al. 2009: 24

† *sibiricus* Ponomarenko, 1985; Russia: Siberia; Middle Jurassic (varA)
Ponomarenko, A. G. 1985: 68. Kolibáč, J. 2006: 121. Ponomarenko, A. G. & Kireichuk, A. G. 2005–2008: http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm. Schmied, H. et al. 2009: 24

† Tribe Lithostomatini Kolibáč & Huang, 2008

Kolibáč, J. & Huang, D.-Y. 2008: 142 (as Lithostomini). Bouchard, P. et al. 2011: 57 (emendation to Lithostomatini)

Type genus. *Lithostoma* Martynov, 1926 [by monotypy and author's designation]
Kolibáč, J. & Huang, D.-Y. 2008: 142. Yu, Y. et al. 2012: 250.

Remarks. This fossil differs from all other Mesozoic Trogossitidae described to date. If Martynov (1926) interpreted the shapes of the head and antennal segments well, it is the first known member of Trogossitidae without a distinct antennal club and with the head narrowed towards its base. The following features of Trogossitidae appear in the fossil: (1) general shape and size of body, (2) distinctly flattened sides of pronotum and elytra, (3) double rows of punctures/tubercles among elytral carinae, (4) robust bidentate mandibles, (5) extremely large scapus, and (6) dilated antennal segments with what are perhaps sensorial fields in the enlarged parts of each segment. The classification within Trogossitinae is based on the presence of the sensorial fields in the enlarged parts of the antennomeres alone. Small tubercles occurring in pronotum and elytra are known in trogossitine genera *Calitys* and *Phanodesta* only; no peltine representative possesses such structures. The tribe differs from the recent and fossil members of Trogossitinae in broadly oval body (this occurs in some Gymnochilini only), pronotum narrowed anteriad, antennae without conspicuous club and asymmetrical segments in flagellum, head narrowed towards base. The shape of antennal segments 10 and 11 is unknown because they are missing (only a trace of segment 10 is visible). The antennae may be only 10-segmented with the last segment enlarged (as in e.g. Egoliini). The new tribe is probably isolated from other tribes of Trogossitinae and may be considered a sister group to them. The ventral part of the fossil is unfortunately unknown, so a classification of *Lithostoma* remains uncertain, chiefly based on the distinctly enlarged scapus.

On the other hand, the concept of Lithostomatini was justifiably called into question by Yu et al. (2012) who argued that insufficient morphological information existed for the establishment of a higher taxon.

† Genus *Lithostoma* Martynov, 1926
http://species-id.net/wiki/Lithostoma
Map 6

Martynov, A. V. 1926: 13 (in Russian), 32 (in English)

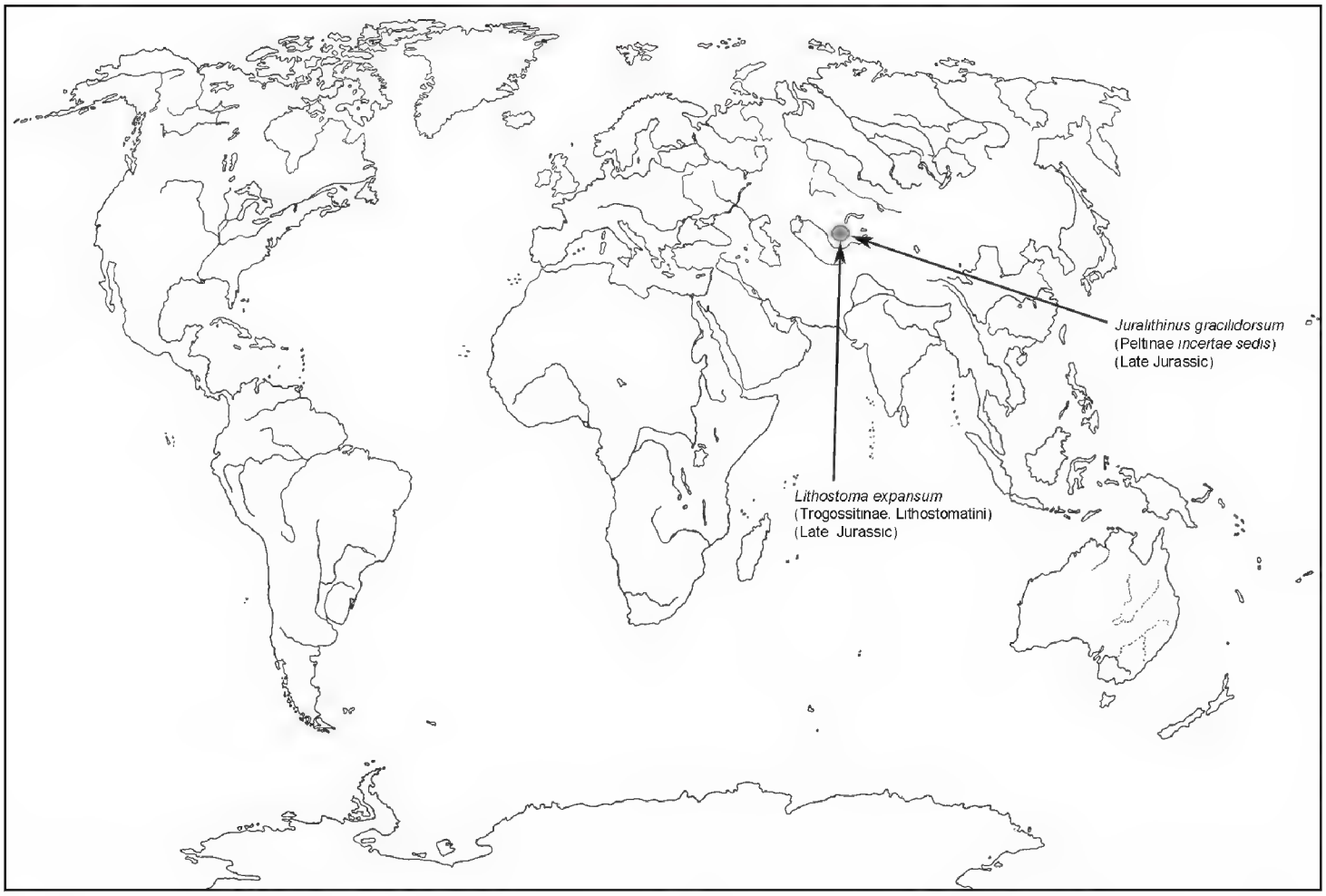
Type species. *Lithostoma expansum* Martynov, 1926 [by monotypy]

Kolibáč, J. & Huang, D.-Y. 2008: 142 (Remarks, English description and translation of Russian description). Ponomarenko, A. G. & Kireichuk, A. G. 2005–2008: http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm. Schmied, H. et al. 2009: 26.

Original description of the genus (translation from Russian). "*Head free, dilated between the eyes* [Russ.: and narrowed backwards]*; mandibulae strong, sharply bent inwards, with perhaps two teeth at the apices; antennae resembling those in living Ostomatinae* [Russ.: in Ostoma and other genera]*; basal joint large, bulbous anteriorly, second much smaller, third still smaller, short, fourth joint of the same width but elongated, 5–7th joints elongated but becoming gradually thicker towards the tip* [Russ.: joints 10 and 11 not preserved], *last 8–11 joints only slightly thicker, without distinct apical club (clavus). Pronotum broadening posteriorly, apparently furnished with marginal dilatations* [Russ.: as in Ostoma]*; covered all over with numerous point-like pits. Elytra broad, rounded at postero-lateral margins* [Russ.: as in Ostoma], *with perhaps 8 longitudinal stripes, each containing two rows of raised black points; intermediate narrow stripes barely elevated; both marginal dilatations also with pits and points* [Russ.: Body size about 6 mm.]." (Martynov 1926: 32.)

Original description of the species. English text: "*Head and antennae as in generic description; sides of pronotum convex, points distinct; elytra broad, rounded at the postero-lateral margins; marginal dilatations rather broad; the dividing stripes not elevated. Length of the body 6 mm.*" (Martynov 1926: 32)

Translation of Russian text: "*Head free, strongly projecting anteriorly (partly artificial condition in compressed specimen). Mandibles robust, left mandible bidentate (right inconspicuous). Antennae as described above, each joint weakly dilated at apex; each dilated area with thin* [sic], *dark, round rim. Final two joints torn off, only a trace of joint 10 present. Pronotum widened towards base, with shallow punctures interspersed with small tubercles. Elytra wide, rounded apically and dorsally* [sic]*; flattened sides well-developed and probably lighter than dark brown convex portion of elytra. Elytra, including flattened sides, with rows of well-developed small, black tubercles* [orig.: "convex punctures"]*; carinae among them not higher than tubercles. Length of body from anterior margin of labrum to apex of elytra – 6 mm.*" (Martynov 1926: 13.)



Map 6. A distribution of the tribe Lithostomatini and the genus † *Juralithinus* (Peltinae *incertae sedis*).

Note: The Russian and English texts vary somewhat from one another; the Russian is more comprehensive.

Distribution. Southern Kazakhstan: paper-shales near Galkino (approximately 42.15N, 70.02E), Chimkentskaya oblast district. Mesozoic: Upper Jurassic, probably Oxfordian.

Species:

† *expansum* Martynov, 1926; Kazakhstan; Upper Jurassic (varA)

Martynov, A. V. 1926: 13 (in Russian), 32 (in English). Kolibáč, J. & Huang, D.-Y. 2008: 143 (Remarks, English description and translation of Russian description). Ponomarenko, A. G. & Kireichuk, A. G. 2005–2008: http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm. Schmied, H. et al. 2009: 26

Subfamily Peltinae Latreille, 1806

Latreille, P. A. 1806: 8, 1825.

Crowson, R. A. 1955: 82. Zherichin, V. V. 1978: 78 (unidentified remnants of two fossils, Turon; Kazachstan: Kzyl-Dzhar). Burakowski, B., Mroczkowski, M. & Stefanska, J. 1986: 121. Lawrence, J. F. & Newton, A. F., Jr. 1995: 868 (Kirby, W. 1837: 104 is considered the author of the family rank name). Klausnitzer, B. 1996: 145. Kolibáč, J. 2006: 125 (diagnosis). Barron, J. R. 1971: 11.

Key to tribes of Peltinae

1 Antenna 8-segmented; body surface with stout scale-like setae; wingless species with convex body ..... **Colydiopeltini**
– Antenna 10- or 11-segmented; body surface without scales or scale-like setae; winged or wingless species with flat or convex or conglobate body **2**
2 Body flat, relatively large (more than 8 mm). Larva without distinct urogomphi ..... **Peltini**
– Body convex or conglobate, smaller (mostly less than 7 mm). Larva with distinct urogomphi **3**
3 Adult: mandible without mola, with membranous penicillus; front coxae distinctly projecting. Larva: mandible without mola, with tridentate lacinia mobilis ..... **Phloiophilini**
– Adult: mandible with mola, membranous penicillus absent; front coxae indistinctly projecting. Larva: mandible with mola, without distinct lacinia mobilis ..... **Thymalini**

Peltinae *incertae sedis*

† Genus *Juralithinus* Kireichuk & Ponomarenko, 1990

http://species-id.net/wiki/Juralithinus
Map 6

Kireichuk, A. G. & Ponomarenko, A. G. 1990: 79 (Peltidae: Meligethiellinae).

Type species. *Juralithinus gracilidorsum* Kireichuk & Ponomarenko, 1990 [by monotypy and original designation]

Kolibáč, J. 2006: 126 (Thymalini). Ponomarenko, A. G. & Kireichuk, A. G. 2005–2008: http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm. Schmied, H. et al. 2009: 24.

Remarks. The genus was originally described in Peltidae and classified within the extinct subfamily Meligethiellinae along with *Meligethiella* and *Ostomalynus* (Kireichuk and Ponomarenko 1990). I accepted the classification within Trogossitidae: Peltinae. However, I synonymized Meligethiellinae and moved all three genera into the extant Thymalini (Kolibáč 2006). Features of *Juralithinus* agree with a general definition of Peltinae, although after re-examination of its description and illustrations, I found the evidence too weak to classify the genus within any of the extant tribes. Therefore, it is listed herein as Peltinae *incertae sedis*. It may be considered an ancestor of Thymalini or Peltini or of both tribes.

Original description of the genus (translation from Russian). "*Diagnosis: Body conspicuously longitudinal, with prothorax relatively elongate and narrow, coxae narrowly separated in all pairs of legs; metathorax without femoral lines* [paracoxal sutures? – they

are drawn in *l.c.*, Fig. 1a]; *elytra distinctly wider than pronotum; first visible abdominal sternite approximately as large as the second to fourth, the last sternite longer.*"

Original description of the species (translation from Russian). "*Elongate-oval beetle* [sic]. *Head with moderately protruded bidentate mandibles, very small transverse mentum and developed gular sutures. Pronotum with anterior margin deeply emarginate and widely rounded anterior corners. Transverse front coxae strongly* [distinctly] *narrowly separated, process between them not observed. Mesothorax convex at centre, middle coxae narrowly separated. Mesonotum wide, with widely rounded scutellum. Metathorax with conspicuous discrimen and paracoxal sutures, outer apices of metepisterna strongly anteriorly projecting. Hind coxae oval, very narrowly separated and obliquely situated towards centre. Elytra, with medium sized epipleurons, seem not to cover abdomen perfectly; their apices possibly artificially* [sic] *broken off. Femora medium-dilated, all with oval outlines. Tibiae weakly dilated towards apices, in middle, strangely enough, relatively thin with elongate apodemes* [orig.: arrows] *at apex. Hind tarsi relatively long, comprised of simple segments* [i.e., without lobes]. *Length – 9.3; width – 4.6; length of elytra – 2.3* [mm]."

Distribution. Kazakhstan: Chimkentskaya obl., Mikhailovka; Mesozoic: Upper Jurassic, Karabastayskaya formation.

Species:

† *gracilidorsum* Kireichuk & Ponomarenko, 1990; Kazakhstan; Upper Jurassic (varA)
Kireichuk, A. G. & Ponomarenko, A. G. 1990: 80. Kolibáč, J. 2006: 126. Ponomarenko, A. G. & Kireichuk, A. G. 2005–2008: http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm. Schmied, H. et al. 2009: 24

† Genus *Sinopeltis* Yu, Leschen, Ślipiński, Ren & Pang, 2012

http://species-id.net/wiki/Sinopeltis
Map 6

Yu, Y., Leschen, R. A. B., Ślipiński, A., Ren, D. & Pang, H. 2012: 246.

Type genus. *Sinopeltis jurassica* Yu, Leschen, Ślipiński, Ren & Pang, 2012

Remarks. This genus, containing two species, has only recently been established. The fossils are well preserved, with both part and counterpart. The species are relatively large, body shape perfectly appropriate to Peltinae or Lophocaterinae. The eyes are distinctly elevate, much more so than those in extant Ancyronini. The 3-segmented antennal club of *S. jurassica* is "weakly asymmetrical" (quite symmetrical in the original picture), that of *S. amoena* is "strongly asymmetrical" (inconspicuously so in the picture). The mesocoxae appear contiguous (unknown state in Trogossitidae) in *S. jurassica*, whereas they are narrowly separated in *S. amoena*. Both discrepancies mentioned may be the results of different positions of body parts (coxae, antennae) assumed during fossilization. Unfortunately, neither the ends of the tibiae nor the tarsi and mouthparts are described in either species, which leads to a lack of direct evidence

for classification. Both *S. jurassica* and *S. amoena* are about 165 million years old and belong, if their classification is correct, together with species of *Thoracotes*, among the oldest known fossil members of Trogossitidae.

Description. "*Body broadly ovoid and parallel-sided. Antenna distinctly clubbed with antennomeres symmetrical* [S. jurassica: *"weakly asymmetrical"*; S. amoena: *"strongly asymmetrical"*]*; antennal insertions visible in dorsal view. Eyes convex. Frontoclypeal suture present. Antennal grooves present and parallel. Anterior pronotal angles well developed and subrounded. Mesoventrite not vaulted. Mesocoxae widely separated* [see "note" in Remarks]. *Metaventrite lacking axillary space and metakatepisternal suture. Metacoxae not excavate and narrowly separated. Elytra with seriate punctation (in one fossil). Abdominal ventrite 1 about as long as 2, intercoxal process narrow. Body length 7.5–7.6 mm, width 4.5–4.8 mm.*" (Diagnosis of the genus according to Yu, Leschen, Ślipiński, Ren & Pang 2012.)

Distribution. China: Inner Mongolia, Daohugou. Middle Jurassic, Jiulongshan formation.

Species:

† *jurassica* Yu, Leschen, Ślipiński, Ren & Pang, 2012; China: Inner Mongolia; Middle Jurassic (AD)

Yu, Y., Leschen, R. A. B., Ślipiński, A., Ren, D. & Pang, H. 2012: 247

† *amoena* Yu, Leschen, Ślipiński, Ren & Pang, 2012; China: Inner Mongolia; Middle Jurassic (AD)

Yu, Y., Leschen, R. A. B., Ślipiński, A., Ren, D. & Pang, H. 2012: 247

Tribe Peltini Latreille, 1806

Latreille, P. A. 1806: 8, 1825.

Type genus. *Peltis* O. F. Müller, 1764

Hunt, T. et al. 2007: 1915 (Peltinae) (molecular phylogeny). Kolibáč, J. 2006: 125 (diagnosis, phylogeny). Kolibáč, J. 2007a: 366. Lawrence, J. F. & Newton, A. F., Jr. 1995: 868 (Kirby, W. 1837: 104 is considered the author of the family rank name). Ślipiński, S. A. 1992: 442 (Peltinae).

Remarks. The single genus *Peltis* exhibits a noteworthy mixture of the both advanced and primitive morphological features. However, some of the derived, especially larval, character states may considered as various kinds of reduction. A few species of *Peltis* are highly adapted to a hidden way of life under tree bark or in rotten wood: they are flattened and slow-moving, their robust mandibles have distinct mola, and the larval urogomphi are strongly reduced. The outer appearance is similar to that in *Calitys*, while some details of both adult and larval morphology (for example the gular appendages in the larval cranium) resemble *Thymalus*. The synonymization of *Zimioma* with *Peltis* is undeniable. Apart from body size, there is no morphological character to distinguish between the two genera.

Genus *Peltis* O. F. Müller, 1764
http://species-id.net/wiki/Peltis
Figs 2, 9, 15; Map 7

Müller, O. F. 1764: 13.

Type species. *Silpha grossa* Linnaeus, 1758 [designated by Hope 1840]

Bacianskas, V. 2009: 30 (biology). Barron, J. R. 1971: 24. Barron, J. R. 1996: 193 (Nearctic species). Kolibáč, J. 2005: 76. Kolibáč, J. 2006: 111. Kolibáč, J. 2007a: 366. Noreika, N. 2009: 68 (distribution). Spahr, U. 1981: 74 (amber and copal fossils).

Gaurambe C. G. Thomson, 1862 [type species: *Silpha ferruginea* Linnaeus, 1758]

Barron, J. R. 1971: 24. Kolibáč, J. 2007a: 366. Lafer, G. Sh. 1992: 83. Silfverberg, H. 1978: 117.

Ostoma Laicharting, 1781 [type species: *Silpha ferruginea* Linnaeus, 1758]

Léveillé, A. 1910: 30. Downie, N. M. & Arnett, R. H. Jr. 1996: 935 (key). Barron, J. R. 1971: 23. Crowson, R. A. 1964a: 295 (*Peltis* Kugel, 1791). Kolibáč, J. 2005: 76 (synonymized). Kolibáč, J. 2007a: 366. Larsson, S. G. 1978: 150 (fossil, Baltic amber). Lafer, G. Sh. 1992: 83. Reitter, E. 1876: 61.

Zimioma Gozis, 1886 [type species: *Silpha grossa* Linnaeus, 1758]

Léveillé, A. 1910: 29 [*Ostoma* (*Zimioma*) Gozis, 1886]. Kolibáč, J. 2007a: 366.

Description. Body size: about 7.5–23.0 mm. Body shape flat. Gular sutures wide, subparallel. Frontoclypeal suture broadly emarginate. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum: ctenidium absent. Antennal groove present. Eyes: size moderate. Eyes number: two. Epicranial acumination moderate. Lacinial hooks: one. Galea: shape elongate. Galea: ciliate setae absent. Mediostipes-Lacinia partially fused. Palpifer: outer edge even. Mandibular apical teeth number: two, horizontally situated. Mola present. Penicillus (at base) absent. Pubescence above mola or cutting edge absent. Ventral furrow absent. Basal notch moderate. Labrum-Cranium not fused. Epipharyngial sclerite absent. Lateral tormal process: projection curved downwards, processes with bridge (*Peltis*). Ligula: ciliate setae absent. Ligula membranous, not retroflexed, deeply emarginate. Hypopharyngeal sclerite consisting of two separate parts. Antenna 11-segmented. Antennal club symmetrical, sensorial fields absent. Front coxal cavities externally open, internally open. Pronotum transverse. Prepectus present. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron moderate. Elytral interlocking mechanism absent, carinae conspicuous. Elytral punctation regular, scales absent. Wing: radial cell oblong (or reduced), wedge cell small (*Peltis*), cross vein MP3-4 present, cross vein AA1+2-3+4 absent. Front tibiae: spines along side moderate. Hooked spur present. Claws: denticle absent. Spiculum gastrale absent. Tegmen composed of three parts. Coxitae divided.

Larva: Frontal arms Y-shaped. Epicranial stem present. Endocarina absent. Gular sutures inconspicuous. Gula: anterior apodemes present. Paragular sclerites absent.

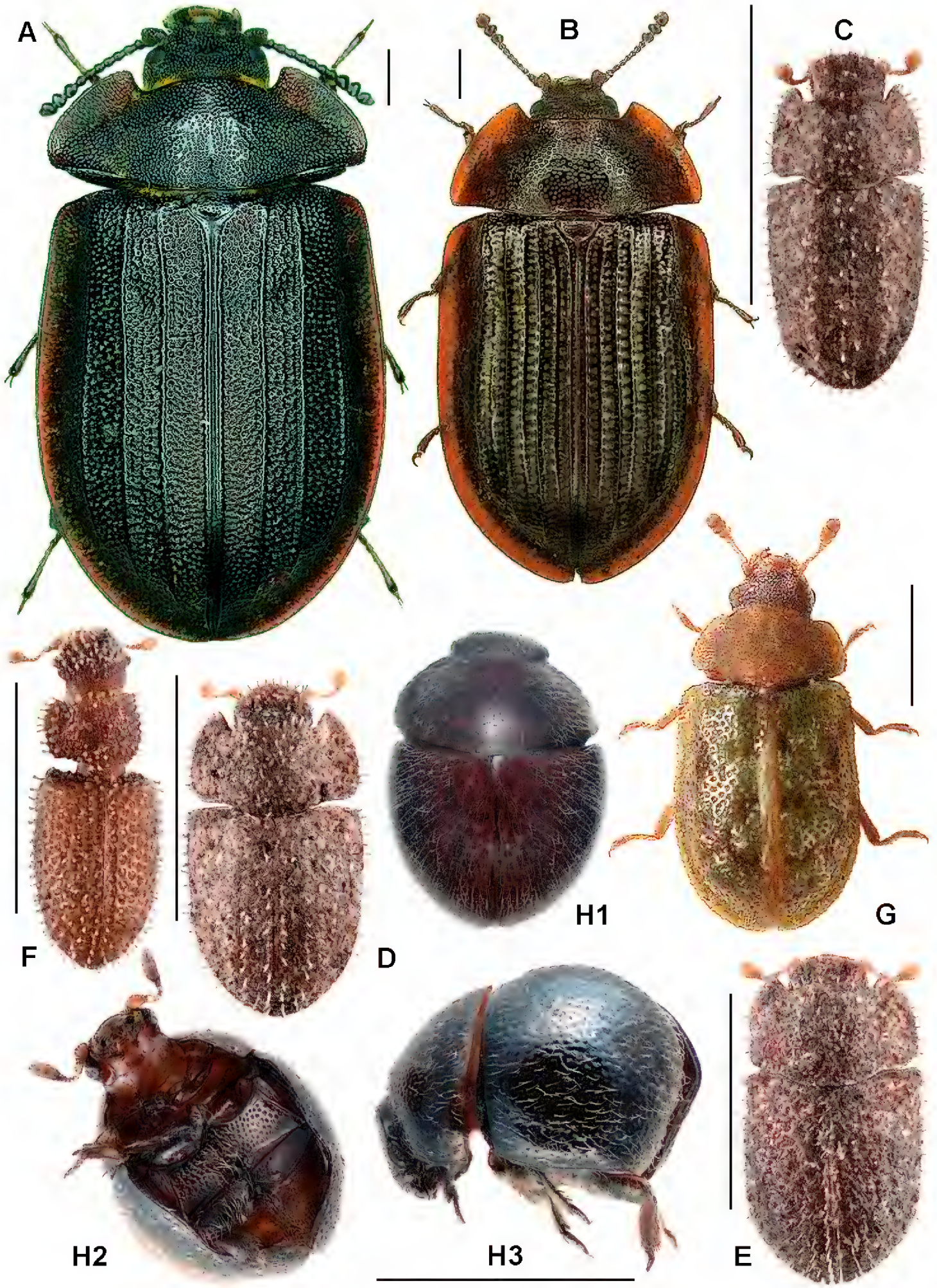
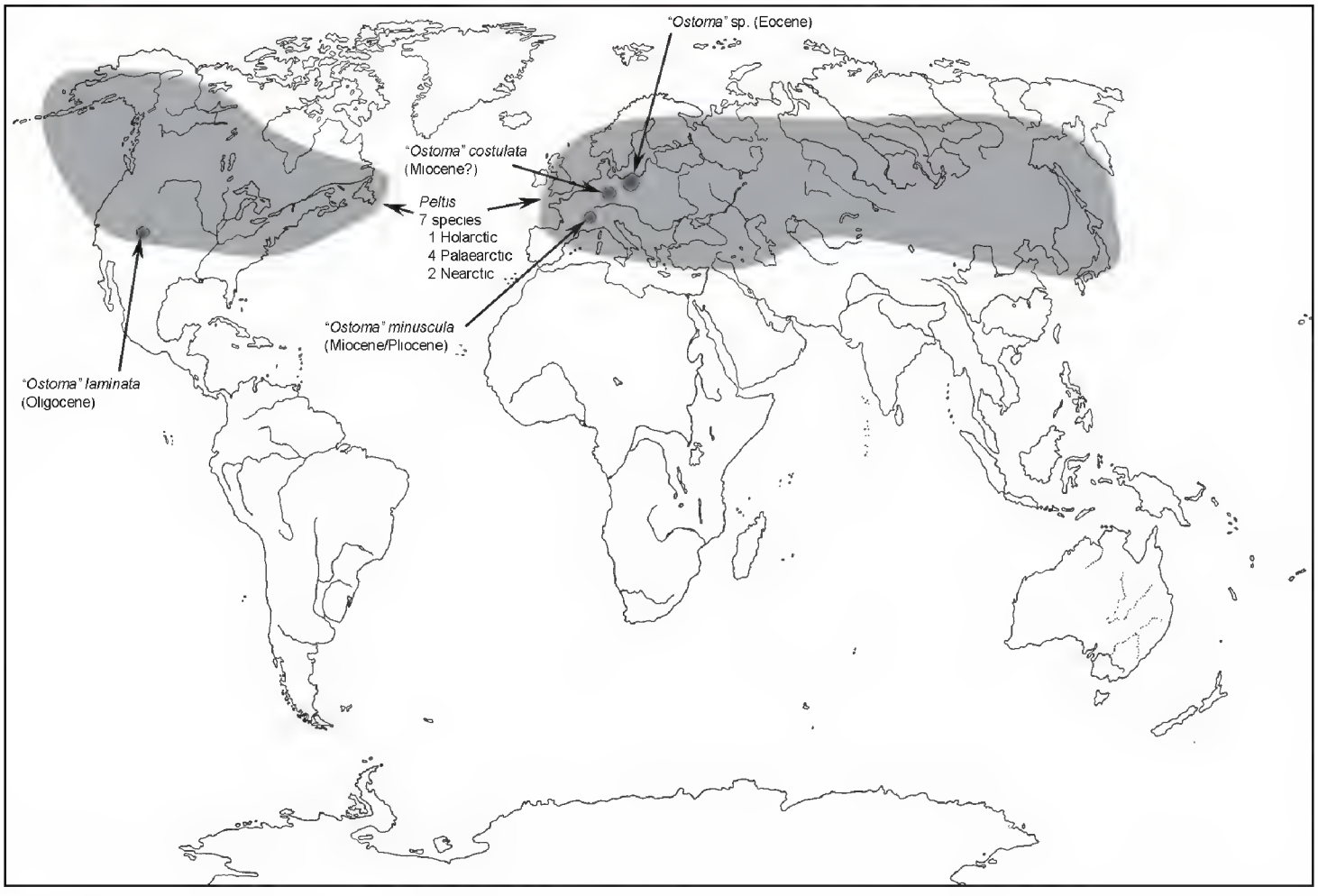


Figure 9. A *Peltis* (syn. *Zimioma*, *Ostoma*) *grossa* **B** *Peltis* (syn. *Ostoma*) *ferruginea* **C** *Colydiopeltis loebli* **D** *Colydiopeltis compactum* **E** *Colydiopeltis burckhardti* **F** *Parapeltis australicum* **G** *Protopeltis viridescens* **H** *cf. Globorentonium plaumanni*, Brazil (**1–3**: three different specimens from the same locality).



Map 7. A distribution of the tribe Peltini.

Hypostomal rods present. Stemmata number: 3. Mandibular apical teeth number: two, horizontally situated. Lacinia mandibulae absent. Mola reduced. Maxillary palpi 3-segmented. Palpifer present. Pedunculate seta absent. Mala simple. Mala: bidentate protrusion present. Cardo-Stipes not fused. Cardo: size much smaller than stipes. Ligula present. Labial palpi 2-segmented. Prementum in two parts, anterior margin even. Torma: two separate lateral sclerites. Antennal joints 1 and 2 elongate. Sensory appendix very small. Thoracic sclerites pattern (dorsally) 0+0+0. Thoracic sclerites pattern (ventrally) 0+0+0. Trochanter oblong. Abdominal segment IX not divided. Tergite IX flat. Urogomphi minute; median process absent.

Biology. Fungivorous. The adults live under the bark of dead or dying deciduous and coniferous trees and feed on fungi. Larvae can be found in rotten or decaying wood, for example at the base of old trees or inside stumps.

Distribution. Holarctic temperate zones: North America from Arizona to Alaska, Europe including British Isles and Scandinavia, Siberia, Korea, Japan.

Species:

columbiana Casey, 1924; widespread USA, Canada (from Alaska) (JRB)
Barron, J. R. 1971: 30
† *constulata* Heyden, 1862; Germany: Rott, Siebengebirge; Tertiary: Upper Oligocene (varA)
Ponomarenko, A. G. & Kireichuk A. G. 2005–2008: http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm. Schmied, H. et al. 2009: 24

ferruginea Linnaeus, 1758; Europe, Siberia, Japan, North Korea, USA, Canada (JK)
Léveillé, A. 1910: 30 (*Ostoma*). Bahillo de la Puebla P. & López-Colón, J. I. 1999: 13 (*Ostoma*). Bahillo de la Puebla P. & López-Colón, J. I. 2004: 129 (*Ostoma*)
Barron, J. R. 1971: 28 (syn. *Ostoma cassidoides* Lepechin, 1774); Russia (JRB)
Barron, J. R. 1971: 28 (syn. *Ostoma cimicoides* Degeer, 1774; not binominal). Barron, J. R. 1971: 28 (*Ostoma*)
Barron, J. R. 1971: 28 (syn. *Ostoma fraternus* Randall, 1838); USA: Maine (JRB)
Barron, J. R. 1971: 28 (syn. *Ostoma nigricans* Dalla Torre, 1879); Oberösterreich (JRB)
Barron, J. R. 1971: 28 (syn. *Ostoma nigrina* Casey, 1916); Canada: British Columbia (JRB)
Barron, J. R. 1971: 28 (syn. *Ostoma rubicunda* Laicharting, 1781); Germania (JRB)
Barron, J. R. 1971: 28 (syn. *Ostoma septentrionalis* Randall, 1838); USA: Maine (JRB)
Borowiec, L. 1983: 13 (*Ostoma*). Burakowski, B. et al. 1986: 122 (*Ostoma*)
Klausnitzer, B. 1976: 7 (*Ostoma*). Klausnitzer, B. 1996: 155 (*Ostoma*, larva). Kolibáč, J. 1993a: 21 (*Ostoma*). Kolibáč, J. 1993b: 90 (*Ostoma*). Kolibáč, J. 1999b: 12 (*Ostoma*). Kolibáč, J. 2006: 108 (larva). Kolibáč, J. 2007a: 366 (syn. *Peltis cimicoides* DeGeer, 1774). Kolibáč, J. 2007a: 366 (syn. *Peltis fraterna* Randall, 1838). Kolibáč, J. 2007a: 366 (syn. *Peltis nigricans* Dalla Torre, 1879). Kolibáč, J. 2007a: 366 (syn. *Peltis nigrina* Casey, 1916). Kolibáč, J. 2007a: 366 (syn. *Peltis rubicunda* Laicharting, 1781). Kolibáč, J. 2007a: 366 (syn. *Peltis septentrionalis* Randall, 1838). Krasutskii, B. V. 1996: 274 (*Ostoma*). Lafer, G. Sh. 1992: 84 (*Ostoma*). Mitter, H. 1998: 561 (*Ostoma*). Nakane, T. et al. 1963: 181 (*Ostoma*). Pileckis, S. & V. Monsevičius 1995: 272 (*Ostoma*). Reitter, E. 1876: 62 (*Ostoma*). Vogt, H. 1967: 17 (*Ostoma*)
gigantea Reitter, 1882; East Siberia, Far East, Japan, China: Northeast Territory (JK)
Léveillé, A. 1910: 29 (*Ostoma* subgen. *Zimioma*). Esaki, T. et al. 1951: 1062 (*Ostoma*). Kolibáč, J. 2007a: 366. Lafer, G. Sh. 1992: 84 (*Zimioma*). Nakane, T. et al. 1963: 181 (*Zimioma*)
grossa Linnaeus, 1758; Europe (JK)
Léveillé, A. 1910: 29 (*Ostoma* subgen. *Zimioma*)
Léveillé, A. 1910: 30 (syn. *Ostoma* (*Zimioma*) *lunata* Fabricius, 1787); Europe (AL)
Bahillo de la Puebla P. & López-Colón, J. I. 1999: 13 (*Zimioma*). Bahillo de la Puebla P. & López-Colón, J. I. 2004: 129 (*Ostoma*). Borowiec, L. 1983: 12. Burakowski, B. et al. 1986: 121 (*Zimioma*). Cunev, J. 1999: 76. Fjellberg, A. & Hansen, S. O. 1997: 77 (biology). Karalius, S. & Monsevičius, V. 1992: 5 (distribution). Klausnitzer, B. 1976: 7 (*Zimioma*). Klausnitzer, B. 1978: 176. Klausnitzer, B. 1996: 156 (larva). Kolibáč, J. 1993a: 21. Kolibáč, J. 1993b: 90. Kolibáč, J. 2005: 139 (redescription). Kolibáč, J. 2007a: 366. Krasutskii, B. V. 2006: 763 (biology). Mamaev, B. M. 1976: 1656 (larva). Mitter, H. 1998: 560 (*Zimioma*). Pileckis, S. & Monsevičius, V. 1995: 272. Ratti, E. 1997: 178. Reitter, E. 1876: 62 (*Ostoma*). Šablevičius, B. & Ferenca, R. 1995: 146. Svitra, G. & Aliukonis, A. 2009: 72 (distribution, biology). Vogt, H. 1967: 17 (*Zimioma*)

jakowlewi Semenov, 1898; Russia: South European Territory (JK)
Léveillé, A. 1910: 30 (*Ostoma* subgen. *Zimioma*). Kolibáč, J. 2007a: 366
† *laminata* Wickham, 1910; USA: Colorado, Florissant; Tertiary: Lower Oligocene (JRB, varA)
Barron, J. R. 1971: 120. Ponomarenko, A. G. & Kireichuk, A. G. 2005–2008: http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm. Schmied, H. et al. 2009: 24. Wickham, H. F. 1910: 48
† *minuscula* Pilton, 1935; France: Cantal; Tertiary: Upper Miocene, Messinian (varA)
Deuve, P. 1988: ii (exact reference unknown). Ponomarenko, A. G. & Kireichuk, A. G. 2005–2008: http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm. Pilton, 1935: ii (exact reference unknown). Schmied, H. et al. 2009: 24
pippingskoeldi Mannerheim, 1852; western states of USA, Canada: British Columbia (JRB)
Léveillé, A. 1910: 31 (*Ostoma*). Barron, J. R. 1971: 25 (*Ostoma*). Dajoz, R. 1997: 44 (*Ostoma*) (biology). Reitter, E. 1876: 62 (*Ostoma*)
valida Lewis, 1894; Japan (JK)
Léveillé, A. 1910: 30 (*Ostoma* subgen. *Zimioma*). Kolibáč, J. 2007a: 366

Tribe Colydiopeltini Kolibáč, 2006

Type genus. *Colydiopeltis* Ślipiński, 1992
Kolibáč, J. 2006: 126.

Remarks. A record by Ivan Löbl and Daniel Burckhardt (Muséum d'Histoire Naturelle Genève) of three minute wingless *Colydiopeltis* species from a forest litter in Thailand, together with their scientific processing (Ślipiński 1992), was one of the most surprising discoveries within Cleroidea to occur in recent decades, rather like the discovery of the rentoniins in the 1960s. The latter author also added a second genus, *Parapeltis*, extracted from litter in Queensland, and he originally classified the two genera together with *Larinotus* within Larinotini (Ślipiński 1992). In a 2006 paper, I split the latter tribe into the monotypic Larinotini related to Egoliini and the newly-established Colydiopeltini. While the nominotypical *Colydiopeltis* shares basic thoracic and mouthpart characters with other trogossitids, *Parapeltis* shows several unusual features: (1) extended clypeus, (2) maxillary lacinia without hooked spine(s), (3) procoxal cavities externally closed, (4) all coxae (especially pro- and metacoxae) short and small (metacoxae do not reach elytral margin), (5) metepisterna extremely wide (see excellent drawings and description by Ślipiński *l.c.*). Labrum, aedeagus and tarsi are of common "trogossitid" structure, although some of these features may be shared with certain non-cleroid Cucujiformia. On the other hand, it should be noted that aptery can have a profound influence on thoracic morphology. I have never studied *P. australicum*, the single species, first-hand, so the classification here follows that by Ślipiński (1992).

Key to genera

1 Rather elongate species, pronotum narrower than elytra; front coxal cavities externally closed; mandible with two apical teeth.....***Parapeltis***

– More compact species, pronotum at base as wide as elytra; front coxal cavities externally open; mandible with one apical tooth..... ***Colydiopeltis***

Genus *Colydiopeltis* Ślipiński, 1992
http://species-id.net/wiki/Colydiopeltis
Figs 9, 16; Map 8

Ślipiński, S. A. 1992: 444.

Type species. *Colydiopeltis burckhardti* Ślipiński, 1992 [by original designation]
Kolibáč, J. 2005: 50. Kolibáč, J. 2006: 111 (phylogeny).

Description. Body size: 1.5–2.0 mm. Body shape convex (not conglobate). Gular sutures wide, convergent at apex. Frontoclypeal suture absent. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum: ctenidium absent. Antennal groove present. Eyes: size moderate. Eyes number: two. Epicranial acumination moderate. Lacinial hooks: two or 1. Galea: shape very small. Galea: ciliate setae absent. Mediostipes-Lacinia fused together. Palpifer: outer edge even. Mandibular apical teeth number: one. Mola present. Penicillus (at base) present (fine, often membranous). Pubescence above mola or cutting edge present. Ventral furrow absent. Basal notch shallow or absent. Labrum-Cranium not fused. Epipharyngial sclerite absent. Lateral tormal process: projection projection curved upwards (*Colydiopeltis*). Ligula: ciliate setae absent. Ligula membranous, not retroflexed, weakly emarginate. Hypopharyngeal sclerite absent. Antenna 8-segmented, sensorial fields absent. Front coxal cavities externally open, internally open. Pronotum transverse. Prepectus present. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron wide. Elytral interlocking mechanism absent, carinae reduced. Elytral punctation regular, scales present. Front tibiae: spines along side reduced. Hooked spur absent, apical spurs not hooked or weakly hooked. Claws: denticle absent. Parasternites number along ventrites III–VII: two. Spiculum gastrale present. Tegmen composed of three parts. Coxitae undivided.

Biology. Unknown. Species of the genus were collected from forest litter by mass-sampling methods in the dry season.

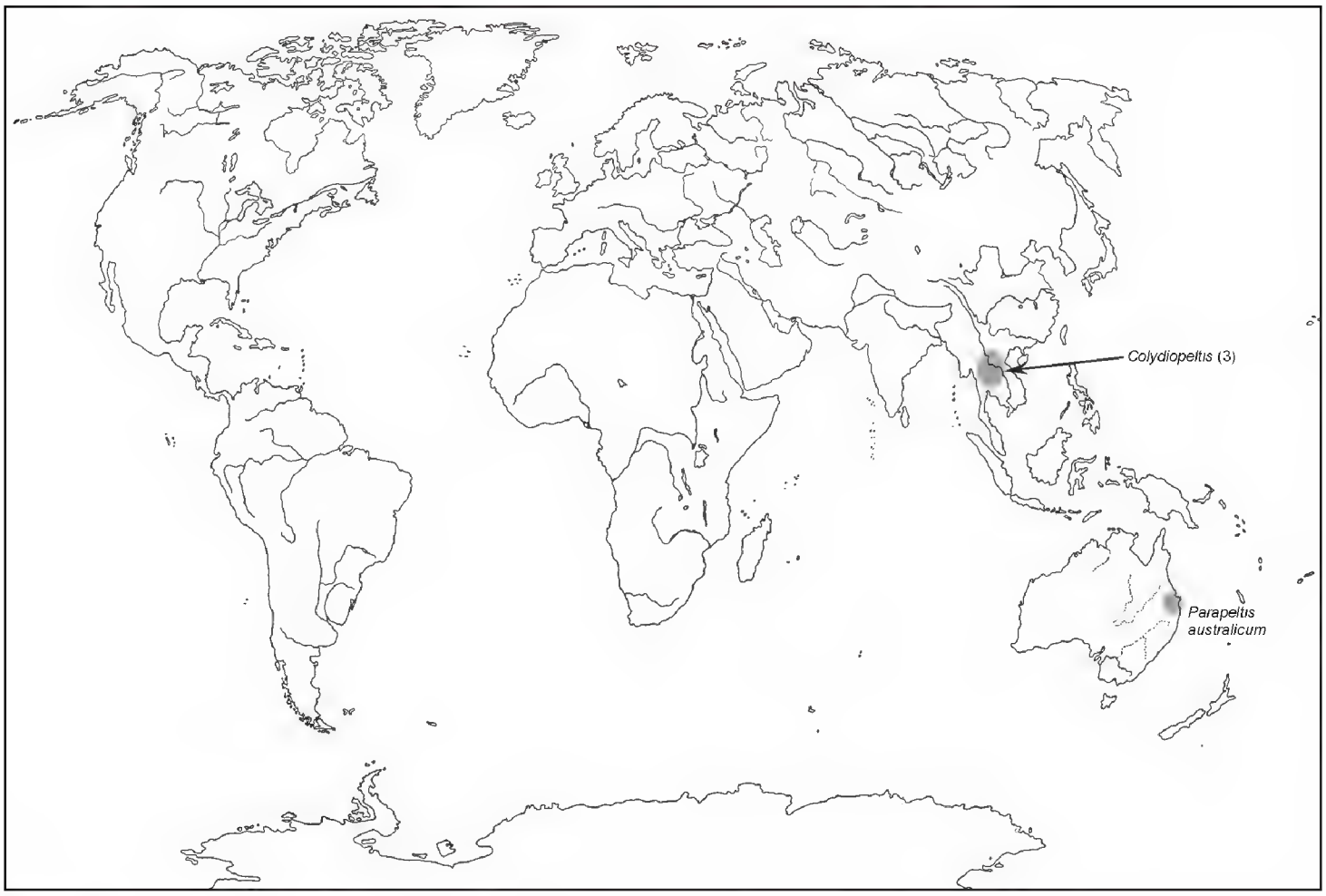
Distribution. Thailand.

Species:

burckhardti Ślipiński, 1992; Thailand: Chiang Mai (AD)
Ślipiński, S. A. 1992: 449. Kolibáč, J. 2005: 49

compactum Ślipiński, 1992; Thailand: NE of Bangkok (AD)
Ślipiński, S. A. 1992: 450

loebli Ślipiński, 1992; Thailand: Phetchaburi, Kanchanburi (AD)
Ślipiński, S. A. 1992: 451



Map 8. A distribution of the tribe Colydiopeltini.

Genus *Parapeltis* Ślipiński, 1992
http://species-id.net/wiki/Parapeltis
Fig. 9; Map 8

Ślipiński, S. A. 1992: 451.

Type species. *Parapeltis australicum* Ślipiński, 1992 [by original designation and monotypy]

Kolibáč, J. 2005: 75. Kolibáč, J. 2006: 111 (phylogeny).

Description. Body size: 1.2 mm. Body shape convex (not conglobate). Gular sutures wide, convergent at apex. Frontoclypeal suture absent. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum: ctenidium absent. Antennal groove present. Eyes: size moderate. Eyes number: two. Epicranial acumination moderate. Lacinial hooks absent. Galea: shape elongate. Galea: ciliate setae absent. Mediostipes-Lacinia fused together. Palpifer: outer edge even. Mandibular apical teeth number: two, horizontally situated. Mola present. Pubescence above mola or cutting edge present. Ventral furrow absent. Basal notch moderate. Labrum-Cranium not fused. Epipharyngial sclerite absent. Lateral tormal process: projection projection curved upwards (*Colydiopeltis*). Ligula: ciliate setae absent. Ligula membranous, not retroflexed, weakly emarginate. Hypopharyngeal sclerite absent. Antenna 8-segmented, sensorial fields absent. Front coxal cavities externally closed, internally open. Pronotum transverse. Prepectus present. Middle coxal cavities open. Elytra:

long hairs absent. Epipleuron moderate. Elytral interlocking mechanism absent, carinae conspicuous. Elytral punctation regular, scales present. Front tibiae: spines along side reduced. Hooked spur absent, apical spurs not hooked or weakly hooked. Claws: denticle absent. Spiculum gastrale present. Tegmen composed of three parts.

Biology. Unknown. Collected from leaf litter in *Eucalyptus* woodland.

Distribution. Australia: Queensland.

Species:

australicum Ślipiński, 1992; Australia: Queensland

Ślipiński, S. A. 1992: 454. Kolibáč, J. 2005: 75

Tribe *Phloiophilini* Kiesenwetter, 1863

Kiesenwetter, E. A. H. von 1863: 666 (Phloeophilidae).

Type genus: *Phloiophilus* Stephens, 1830

Bouchard, P. et al. 2011: 56 (as Phloiophilidae). Klausnitzer, B. 1996: 145. Kolibáč, J. 1987: 110. Kolibáč, J. 2004a: 242. Kolibáč, J. 2008: 123 (phylogeny; stat. n. *sub* Trogossitidae). Lohse, G. A. 1979: 83 (as Phloeophilinae; *sub* Melyridae). Lawrence, J. F. 1982: 519 (morphology, systematics). Lawrence et al. 1993: CD-ROM (morphology of larvae). Lawrence et al. 1999a: CD-ROM (morphology of larvae). Lawrence et al. 1999b: CD-ROM (morphology of larvae). Majer 1994. Lawrence, J. F. & Newton, A. F., Jr. 1995: 867 (phylogeny). Mayor, A. 2007: 363 (distribution). Pic, M. 1926: 2.

Remarks. *Phloiophilus* has been classified within Dasytidae or Melyridae *sensu lato* (Reitter 1911, Lohse 1979) or as a part of an independent family, i.e. Phloiophilidae (= Phloeophilidae), formerly in conjunction with the genera *Xerasia* Lewis (now Byturidae) and *Acanthocnemus* Perris (Pic 1926). The latter genus is now classified in the monotypic family Acanthocnemidae Crowson, 1970 within the melyrid branch of Cleroidea or as a sister group of the rest of Cleroidea, whereas Phloiophilidae is generally considered a relative of Trogossitidae (Crowson 1964a, Gunter et al. 2013, Kolibáč 2004, Klausnitzer 1996, Lawrence et al. 1993, 1999a, b, Majer 1994). Recently, Hunt et al. (2007) published a comprehensive study based exclusively on molecular data, according to which *Phloiophilus edwardsi* is related to Biphyllidae and Byturidae. Both the families are situated in a basal position of Cleroidea, near to Trogossitidae. On the other hand, preliminary outcomes of work by the Tree of Life team (McKenna et al. 2012) as well as by Gunter et al. (2013), which are also based on molecular data, show a close relationship between *Phloiophilus* and Trogossitidae as well. Also believing in this relationship from a morphological point of view, I attempted to put its morphological characters into the trogossitid character matrix of 2006 (Kolibáč 2008). A computer analysis within the NONA program indicated a relationship between *Phloiophilus* and basal Peltinae but, to be honest, a detailed analysis of character states shows that the supposed relationship is at least partly based on shared plesiomorphies as well as "reductions" common in all Cleroidea. Thus, the position and status of the single genus

of Phloiophilidae/Phoiophilini remains uncertain. It is included herein at the rank of tribe but, in the light of future discoveries, it may also be shifted from Cleroidea to a group within traditional "Cucujoidea". The genus *Phloiophilus* was unfortunately not included in the most modern morphological analysis by Lawrence et al. (2011).

Genus *Phloiophilus* Stephens, 1830

http://species-id.net/wiki/Phloiophilus
Figs 10, 15; Map 9

Stephens, J. F. 1830: 81.

Type species. *Phloiophilus edwardsii* Stephens, 1830 [by monotypy]

Lohse, G. A. 1979: 83 (*Phloeophilus*, *sub* Melyridae). Majer, K. 1986: 114. Kolibáč, J. 2008: 105.

Description. Body size: about 3.0 mm. Body shape convex (not conglobate). Gular sutures wide, subparallel. Frontoclypeal suture absent. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum: ctenidium absent. Antennal groove absent. Eyes: size moderate. Eyes number: two. Epicranial acumination absent. Lacinial hooks: two. Galea: shape sub-clavate. Galea: ciliate setae absent. Mediostipes-Lacinia fused together. Palpifer: outer edge even. Mandibular apical teeth number: two, horizontally situated. Mola absent. Penicillus (at base) present (fine, often membranous). Pubescence above mola or cutting edge present. Ventral furrow absent. Basal notch shallow or absent. Labrum-Cranium not fused. Epipharyngial sclerite absent. Lateral tormal process: projection projection not developed (all remaining). Ligula: ciliate setae absent. Ligula membranous, not retroflexed, deeply emarginate. Hypopharyngeal sclerite absent. Antenna 11-segmented. Antennal club symmetrical, sensorial fields absent. Front coxal cavities externally open, internally open. Pronotum transverse. Prepectus present. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron thin. Elytral interlocking mechanism absent, carinae reduced. Elytral punctation irregular, scales absent. Wing: radial cell oblong (or reduced), wedge cell present, cross vein MP3-4 present, cross vein AA1+2-3+4 absent. Front tibiae: spines along side reduced. Hooked spur absent, apical spurs not hooked or weakly hooked. Claws: denticle absent. Tegmen composed of only one part. Coxitae divided.

Larva: Frontal arms curved (cucujoid). Epicranial stem reduced. Endocarina present. Gular sutures inconspicuous. Gula: anterior apodemes present. Paragular sclerites absent. Hypostomal rods absent. Stemmata number: five. Mandibular apical teeth number: two, horizontally even, vertically situated. Lacinia mandibulae tridentate. Mola absent. Maxillary palpi 3-segmented. Pedunculate seta absent. Mala simple. Mala: bidentate protrusion present. Ligula present. Labial palpi 2-segmented. Antennal joints 1, 2 transverse. Sensory appendix larger than half of joint 3. Thoracic sclerites pattern

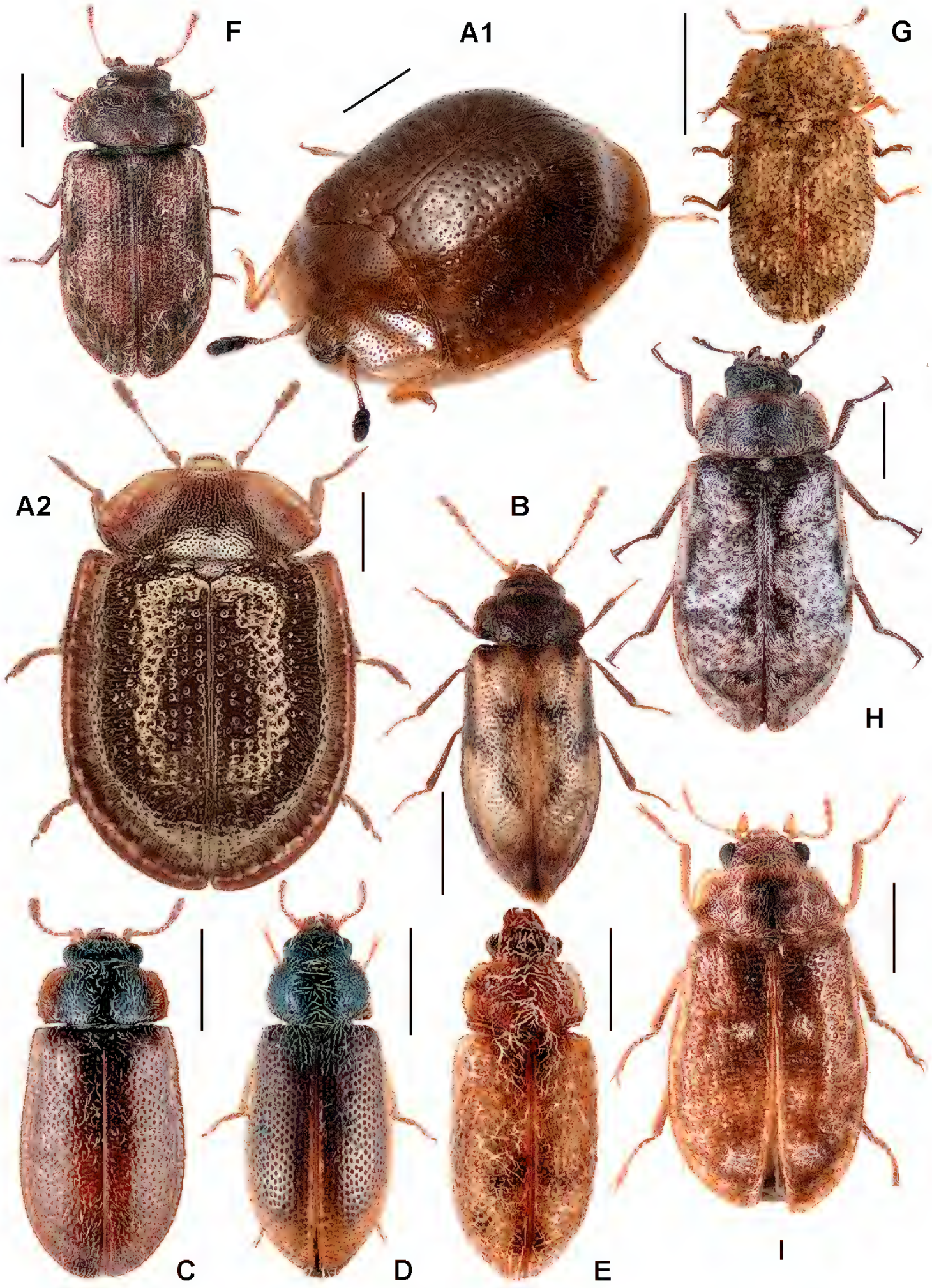


Figure 10. A *Thymalus limbatus* **B** *Phloiophilus edwardsi* **C** *Eronyxa marginicollis* **D** *Decamerus haemorhoidalis* **E** *Diontolobus punctatipennis* **F** *Afrocyrona ciskeiensis* **G** *Afrocyrona dwesae* **H** *Grynoma* sp., New Zealand **I** *Grynoma diluta*.

Map 9. A distribution of the tribe Phloiophilini.

(dorsally) 1-0-0. Thoracic sclerites pattern (ventrally) 1+1+1. Abdominal segment IX not divided. Tergite IX flat. Urogomphi present, hooked; median process absent.

Biology. Fungivorous. Crowson (1964b) noted adults and larvae from Great Britain: Adult and larva fungivorous, larvae feed beneath the thin and fleshy fruiting bodies of the basidiomycete *Phlebia radiata* Fr. of the Meruliaceae, which occurs on the dead wood of various deciduous trees (oak, beech, hazel), occasionally also conifers (pine). Adults are active in the warm days of autumn and winter (approximately, from late September to March). They have not been observed outside that period. They can be collected by sweeping from dry or decaying branches. Larvae may be found at all seasons, under the fruiting bodies of the fungus or under bark in spring and summer. Wielink et al. (2010) observed the species in the Netherlands and found adults active only by night. They live together with larvae on dead oak branches infested by the fungus *Peniophora quercina*.

Distribution. Europe, North Africa.

Species:

edwardsii Stephens, 1830; Austria, Belgium, Czechia, Denmark, France, Great Britain, Germany, Hungary, Ireland, the Netherlands, Poland, North Africa (JK)

Audisio, P. et al. 1995: 14. Beutel, R. G. & Pollock, D. A. 2000: 826 (larva, morphology). Crowson, R. A. 1964b: 151 (biology). Gurlich, S. et al. 1995: 49. Klausnitzer, B. 1996: 161. Kolibáč, J. 1999: 12. Kolibáč, J. 2008: 120. Lohse, G. A. 1979: 83 (*Phloeophilus*, *sub* Melyridae). Majer, K. 1986: 114. Mayor, A. 2007: 363 (syn. *Phloiophilus bimaculatus* Stephens, 1830; synonymized by whom?).

Mayor, A. 2007: 364 (syn. *Phloiophilus cooperi* Stephens, 1830; synonymized by whom?). H. Vogt 1967: 13. Wielink van, P. et al. 2010: 17 (biology)

Tribe Thymalini Léveillé, 1888

Léveillé, A. 1888: 444.

Type genus. *Thymalus* Latreille, 1802

Kireichuk, A. G. & Ponomarenko, A. G. 1990: 79 (Meligethiellinae, new Mesozoic subfamily). Kolibáč, J. 2006: 126 (diagnosis, stat. n.). Kolibáč, J. 2007a: 366. Krivosheina, N. P. & Mamaev, B. M. 1981: 50. Lawrence, J. F. & Newton, A. F. Jr. 1995: 868 (Protopeltinae; Rentoniinae). Ślipiński, S. A. 1992: 442 (Protopeltinae, Rentoniinae).

Meligethiellinae Kireichuk & Ponomarenko, 1990

Kolibáč, J. 2006: 126 (synonymized). revalid. subfam. Note: Removed from synonymy; see the "Remarks" section for explanation of this synonymy.

Protopeltini Crowson, 1966; Protopeltinae Crowson, 1970

Kolibáč, J. 2006: 126 (synonymized).

Rentoniini Crowson, 1966; Rentoniinae Crowson, 1966 (Rentoniinae = Protopeltini + Rentoniini; all Crowson 1966: 120); Rentoniinae Crowson, 1970 (= new status for Rentoniini, i.e. without *Protopeltis*)

Kolibáč, J. 2006: 126 (synonymized).

Remarks. A recent and extensive morphological study by Lawrence et al. (2011) considered Trogossitidae and even Cleroidea polyphyletic. In their phylogenetic tree, *Thymalus* is included in a cluster of the nitidulid genera along with *Cyclaxyra* and *Lamingtonium*, whereas the position of *Rentonellum* lies in a different part of the traditional Cucujoidea, near *Smicrips*, *Propalticus* and *Laemophloeus*. Leschen et al. (2012) used a restricted data set adopted from the Lawrence et al. (2011) study and found Cleroidea monophyletic but Trogossitidae polyphyletic: *Rentonellum* was a part of the melyrid group and *Thymalus* formed a sister group to all the remaining cleroids. The latter authors also suggested that the subfamily Rentoniinae be re-established. It is beyond the scope of the work in hand to assess this matter; it was prepared "in-group", without using the extensive cucujiform outgroups. The morphological evidence used in the both above papers indicates the need to check Thymalini classification again, in the context of the wider cucujiform dataset, using molecular data. A new species of "*Rentonium*-group" has recently been discovered in South Africa (Leschen et al. 2012). Further new species is just described by Gimmel and Leschen (in press) together with its associated larva. It appears that the features of this larval record confirm Crowson's earlier identification of the rentoniine larva from New Zealand (Crowson 1966).

Since the extinct Mesozoic genera *Meligethiella* and *Ostomalynus* are excluded from Thymalini, Peltinae and Trogossitidae herein, the synonymization of the subfamily Meligethiellinae is not valid henceforth and the taxon should not be further listed in synonymy of the tribe Thymalini.

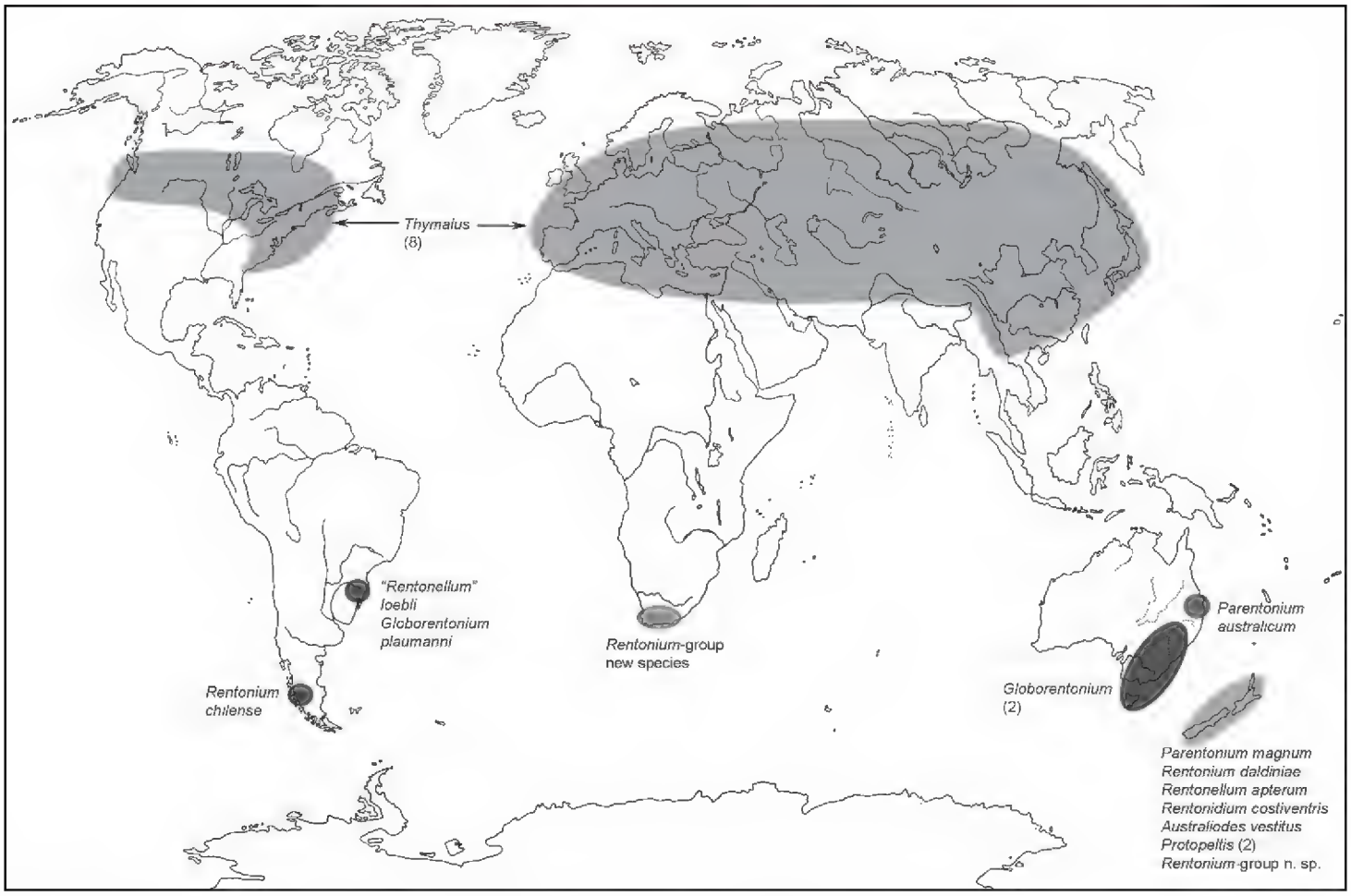
Key to genera (*Globorentonium* Lawrence & Ślipiński, 2013 not included)

1 Body convex but not conglobate; elytra with conspicuous punctation **2**
– Body conglobate; elytra without sculpture (smooth) or with very fine irregular punctures or shagreened..... **3**
2 Body extremely bulged; head including eyes covered by pronotum when viewed from above (only clypeus and labrum visible); larger species (about 4–7 mm) ..... ***Thymalus***
– Body convex but not extremely bulged; head protruding (not covered by pronotum when viewed from above); smaller species (about 2.5 mm) ..... ***Protopeltis***
3 Elytra with light and dark spots; pubescence formed by short decumbent and long erect hairs..... ***Australiodes***
– Elytra unicolorous, without spots; pubescence absent or made up of short hairs only..... **4**
4 Elytra smooth, without pubescence, strongly involute; middle tibiae with row of spines at apex; wingless ..... ***Rentonellum***
– Elytra pubescent, not involute; middle tibiae probably without row of spines at apex; mostly winged..... **5**
5 Middle coxal cavities widely separated; ventrites II–V with deeply transversely impressed anterior margins; last antennal segment transverse and truncate at apex; pubescence of elytra with shot-silk effect..... ***Parentonium***
– Middle coxal cavities narrowly separated; ventrites II–V with or without weakly impressed anterior margins; last antennal segment not truncate at apex; pubescence of elytra sparse, directed backwards, without shot-silk effect..... **6**
6 Head strongly transverse; front margin of clypeus with marked emargination; first ventrite with median keel at least in front; ventrites II–IV each with transverse line of strong backward-projecting setae near its hind border ..... ***Rentonidium***
– Head not transverse or only slightly so; front margin of clypeus almost straight; first ventrite without median keel; ventrites II–IV without such apical lines of setae ..... ***Rentonium***

Genus *Australiodes* Endrödy-Younga, 1960
http://species-id.net/wiki/Australiodes
Map 10

Endrödy-Younga, S. 1960: 239 [*sub* Liodidae]

Type species: *Clambus vestitus* Broun, 1886 [by monotypy]
Crowson, R. A. 1966: 120 (transferred from Liodidae to Trogossitidae: Peltinae). Kolibáč, J. 2005: 47. Kolibáč, J. 2006: 116 (phylogeny).



Map 10. A distribution of the tribe Thymalini including *Rentonium*-group.

Description. Body size: 1.4 mm. Body shape conglobate. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Eyes number: two. Lacinial hooks absent. Galea: shape partially fused with lacinia. Galea: ciliate setae absent. Mediostipes-Lacinia fused together. Labrum-Cranium not fused. Front coxal cavities externally open, internally closed. Pronotum subquadrate. Elytra: long hairs absent. Tegmen composed of a single unit (Kolibáč 2005).

"*Maxilla with galea and lacinia largely fused; erect setae among pubescence of upper surface; metendosternite with elongate oblique arms, without lamina; elytra with pattern of light and dark patches*" (ex Crowson 1966).

Biology. Adults were collected by Crowson (1966: 123) "*in* Leucopogon *flowers and on male catkins of the introduced* Pinus insignis. *Adults were also found under loose bark of a dead* Hoheria."[...] "*Adults doubtless feed on pollen, as shown by the gut-contents of a dissected specimen; the breeding sites are probably somewhere about dead trees ...*" Crowson (1966).

Distribution. New Zealand: Port Nicholson, Wellington; Waipoua State Forest, Northland; Western Hills, Whangarei.

Species:

vestitus Broun, 1886; New Zealand (varA)

Crowson, R. A. 1966: 120. Endrödy-Younga, S. 1960: 239 (Liodidae). Kolibáč, J. 2005: 47

Genus *Globorentonium* Lawrence & Ślipiński, 2013
http://species-id.net/wiki/Globorentonium
Figs 9, 17; Map 10

Lawrence, J. F. & Ślipiński, S. A. 2013: 258.

Type species. *Globorentonium globulum* Lawrence & Ślipiński, 2013 [by original designation].

Remarks. The genus has been just recently described, therefore, it is not included in a generic key to Thymalini. A key to the all genera of *Rentonium*-group (denoted as Rentoniini Crowson, 1966) is provided by authors (Lawrence and Ślipiński 2013: 270). *Globorentonium* includes three newly described species. A key to their recognition is also provided by the authors of original descriptions (Lawrence and Ślipiński 2013: 259). Four supposed specimens of *Globorentonium plaumanni* from the same locality as the type series (Brazil: Santa Catarina, Nova Teutonia, leg. F. Plaumann 1972–77) are figured here.

Distribution. Australia: Victoria, New South Wales, Tasmania; Brazil: Santa Catarina.

Species:

globulum Lawrence & Ślipiński, 2013; Australia: Victoria, NSW, Tasmania (AD)
Lawrence, J. F. & Ślipiński, S. A. 2013: 260
lescheni Lawrence & Ślipiński, 2013; Australia: NSW (AD)
Lawrence, J. F. & Ślipiński, S. A. 2013: 264
plaumanni Lawrence & Ślipiński, 2013; Brazil: Santa Catarina (AD)
Lawrence, J. F. & Ślipiński, S. A. 2013: 268

Genus *Parentonium* Crowson, 1970
http://species-id.net/wiki/Parentonium
Map 10

Crowson, R. A. 1970: 6.

Type species. *Rentonium magnum* Crowson, 1966 [by original designation]
Kolibáč, J. 2005: 76. Kolibáč, J. 2006: 116 (phylogeny).

Description. Body size: 1.3–2.0 mm. Body shape conglobate. Gular sutures wide, subparallel. Frontoclypeal suture present. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum of males: ctenidium absent. Antennal groove present. Eyes: size large, lateral. Eyes number: two. Epicranial acumination absent. Lacinial hooks absent. Galea: shape partially fused with lacinia. Galea: ciliate setae absent. Mediostipes-Lacinia fused together. Palpifer: outer edge denticulate. Front coxal cavities externally open, in-

ternally closed. Pronotum transverse. Elytra: long hairs absent. Epipleuron wide. Elytral interlocking mechanism absent, scales absent. Front tibiae: spines along side reduced. Claws: denticle absent.

Biology. *Parentonium australicum* was found under the bark of a fallen *Nothofagus* trunk at an altitude of about 1200 m. *Parentonium magnum* was collected in mixed leaf-litter at about 250 m (Crowson 1966). It is presumed that the species are fungivorous.

Distribution. Australia: Queensland, Lamington National Park; New Zealand: Grampian Hill, Nelson.

Species:

australicum Crowson, 1970; Australia: Queensland (RAC)

Crowson, R. A. 1970: 6

magnum Crowson, 1966; New Zealand (RAC)

Crowson, R. A. 1966: 121 (*Rentonium*). Crowson, R. A. 1970: 6 (*Parentonium*, combination). Kolibáč, J. 2005: 76

Genus *Protopeltis* Crowson, 1964

http://species-id.net/wiki/Protopeltis

Fig. 9; Map 10

Crowson, R. A. 1964a: 287, 295.

Type species. *Grynoma viridescens* Broun, 1886 [by original designation]

Crowson, R. A. 1964a: 295. Crowson, R. A. 1966: 120. Kolibáč, J. 2005: 79. Kolibáč, J. 2006: 111 (phylogeny).

Description. Body size: about 2.5 mm. Body shape flat. Gular sutures wide, subparallel. Frontoclypeal suture absent. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum: ctenidium absent. Antennal groove present. Eyes: size large, lateral. Eyes number: two. Lacinial hooks: three. Galea: shape elongate. Galea: ciliate setae absent. Palpifer: outer edge even. Mandibular apical teeth number: two, horizontally situated. Mola present. Penicillus (at base) absent. Pubescence above mola or cutting edge present. Ventral furrow present. Basal notch moderate. Labrum-Cranium not fused. Ligula: ciliate setae absent. Ligula membranous, not retroflexed. Antenna 11-segmented. Antennal club symmetrical, sensorial fields absent. Front coxal cavities externally open, internally open. Pronotum transverse. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron moderate. Elytral interlocking mechanism absent, carinae reduced. Elytral punctation irregular, scales absent. Wing: radial cell oblong (or reduced), wedge cell absent, cross vein MP3-4 absent, cross vein AA1+2-3+4 absent. Front tibiae: spines along side moderate. Claws: denticle absent. Tegmen composed of two parts.

Larva: Frontal arms curved (cucujoid). Epicranial stem present. Endocarina present. Gular sutures conspicuous, parallel. Gula: anterior apodemes present. Paragular

sclerites absent. Hypostomal rods absent. Stemmata number: five. Mandibular apical teeth number: two, horizontally situated. Lacinia mandibulae tridentate. Mola absent. Maxillary palpi 3-segmented. Palpifer present. Pedunculate seta absent. Mala simple. Mala: bidentate protrusion present. Cardo-Stipes not fused. Cardo: size much smaller than stipes. Labial palpi 2-segmented. Prementum in single part, anterior margin even. Antennal joints 1, 2 transverse. Sensory appendix larger than half of joint 3. Thoracic sclerites pattern (dorsally) 1-2-2. Thoracic sclerites pattern (ventrally) 1+0+0. Trochanter triangular. Abdominal segment IX not divided. Tergite IX flat. Urogomphi present, hooked; median process absent.

Biology. Larvae of *P. viridescens* were collected, according to Crowson's note, at "*fungusy bark of dead* Nothofagus". The adult gut he examined contained "*abundant fungal material*", determined as "*probably* Hymenochaete *sp.*" (Crowson 1964a). Larva and adult are probably fungivorous.

Distribution. New Zealand (for example, Arthur's Pass National Park).

Species:

pulchella Broun, 1915; New Zealand (RAC)

Broun, T. 1915: 314 (*Promanus*). Crowson, R. A. 1964a: 289

viridescens Broun, 1886; New Zealand (RAC)

Léveillé, A. 1910: 29 (*Grynoma*). Crowson, R. A. 1964a: 290 (larva). Iablokoff-Khnzorian, S. M. 1975: 147. Kolibáč, J. 2005: 78. Kolibáč, J. 2006: 109

Genus *Rentonellum* Crowson, 1966

http://species-id.net/wiki/Rentonellum

Figs 9, 17; Map 10

Crowson, R. A. 1966: 120.

Type species. *Rentonellum apterum* Crowson, 1966 [by original designation and monotypy]

Kolibáč, J. 2005: 80. Kolibáč, J. 2006: 111 (phylogeny).

Description. Body size: about 1.0 mm. Body shape conglobate. Gular sutures wide, subparallel. Frontoclypeal suture present. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum: ctenidium absent. Antennal groove present. Eyes: size large, lateral. Eyes number: two. Epicranial acumination absent. Lacinial hooks absent. Galea: shape partially fused with lacinia. Galea: ciliate setae absent. Mediostipes-Lacinia fused together. Palpifer: outer edge even. Mandibular apical teeth number: two, horizontally situated. Mola present. Penicillus (at base) absent. Pubescence above mola or cutting edge absent. Ventral furrow absent. Basal notch shallow or absent. Labrum-Cranium not fused. Epipharyngial sclerite absent. Lateral tormal process: projection projection not developed (all remaining). Ligula: ciliate setae absent. Ligula rigid, not retroflexed, weakly emarginate. Hypopharyngeal sclerite consisting of two separate parts. Antenna

10-segmented. Antennal club symmetrical, sensorial fields absent. Front coxal cavities externally open, internally closed. Pronotum transverse. Prepectus absent. Middle coxal cavities closed. Elytra: long hairs absent. Epipleuron wide. Elytral interlocking mechanism absent, carinae reduced. Elytral punctation irregular, scales absent. Front tibiae: spines along side reduced. Hooked spur absent, apical spurs not hooked or weakly hooked. Claws: denticle absent. Parasternites number along ventrites III–VII: one. Coxitae undivided.

Biology. *R. apterum* was found in *Nothophagus* and *Podocarpus* leaf-litter at an altitude of 900 m (Crowson 1966). The circumstances of the second species record are not known.

Distribution. New Zealand; Brazil: "Nova Teutonia".

Species:

apterum Crowson, 1966; New Zealand (RAC)

Crowson, R. A. 1966: 120. Kolibáč, J. 2005: 80

loebli Kolibáč, 2005; Brazil: "Nova Teutonia" (JK)

Kolibáč, J. 2005: 80

Note: It has been recently proposed that *R. loebli* might be a ciide rather than a rentoniine species (Lawrence and Ślipiński 2013)

Genus *Rentonidium* Crowson, 1966

http://species-id.net/wiki/Rentonidium

Figs 9, 17; Map 10

Crowson, R. A. 1966: 123.

Type species. *Rentonidium costiventris* Crowson, 1966 [by original designation and monotypy]

Kolibáč, J. 2005: 81. Kolibáč, J. 2006: 116 (phylogeny).

Description (according to Crowson 1966, modified). Body size: 1.3 mm. Adult: Body conglobate. General form short ovate and very convex, Byrrhid-like; length not more than 2 mm. Head strongly transverse; front margin of clypeus with a marked emargination; galea and lacinia separate; lacinia without spines or hooks; no erect setae on upper body surface; metendosternite with slender lamina. Front coxal cavities internally closed, coxae very elongate, separated by a very narrow process; first ventrite with a median keel at least in front; ventrites II–IV each with a transverse line of strong backward-projecting setae near its hind border; tegmen undivided.

Biology. Collected in "*male flower of* Pinus insignis" (Crowson 1966). Probably feeding on pollen grains as do the adults of *Australiodes*.

Distribution. New Zealand: Northland, Waipoua State Forest.

Species:

costiventris Crowson, 1966; New Zealand (RAC)

Crowson, R. A. 1966: 123. Kolibáč, J. 2005: 81

Genus *Rentonium* Crowson, 1966

http://species-id.net/wiki/Rentonium
Figs 9, 17; Map 10

Crowson, R. A. 1966: 121.

Type species. *Rentonium daldiniae* Crowson, 1966 [by original designation and monotypy]

Crowson, R. A. 1970: 6. Kolibáč, J. 2005: 81 (redescription). Kolibáč, J. 2006: 111 (phylogeny).

Description. Body size: 1.3–1.5 mm. Body shape conglobate. Gular sutures wide, subparallel. Frontoclypeal suture absent. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum: ctenidium absent. Antennal groove present. Eyes: size large, lateral. Eyes number: two. Epicranial acumination absent. Mandibular apical teeth number: one. Mola reduced but present. Penicillus (at base) absent. Pubescence above mola or cutting edge absent. Ventral furrow absent. Basal notch shallow or absent. Labrum-Cranium not fused. Epipharyngial sclerite absent. Lateral tormal process: projection projection not developed (all remaining). Ligula: ciliate setae absent. Ligula rigid, not retroflexed, weakly emarginate. Hypopharyngeal sclerite H-shaped. Antenna 10-segmented. Antennal club symmetrical, sensorial fields absent. Front coxal cavities externally open, internally closed. Pronotum transverse. Epipleuron thin. Elytral interlocking mechanism absent, carinae reduced. Elytral punctation irregular, scales absent. Wing: radial cell oblong (or reduced), wedge cell absent, cross vein MP3-4 absent, cross vein AA1+2-3+4 absent. Front tibiae: spines along side moderate. Hooked spur absent, apical spurs not hooked or weakly hooked. Claws: denticle absent. Spiculum gastrale present. Tegmen composed of only a single unit.

Larva: Frontal arms V-shaped. Epicranial stem absent. Endocarina present. Hypostomal rods absent. Stemmata number: five. Mandibular apical teeth number: two, horizontally situated. Lacinia mandibulae with several small spines. Mola absent. Maxillary palpi 2-segmented. Labial palpi 1-segmented. Torma: two separate lateral sclerites. Antennal joints 1, 2 transverse. Sensory appendix larger than half of joint 3. Thoracic sclerites pattern (dorsally) 1-2-2. Abdominal segment IX not divided. Tergite IX flat. Urogomphi present, hooked; median process absent.

Biology. The single known larva described (Crowson speculated that it might be identified as *Rentonium daldiniae*) was extracted from a forest litter sample (mainly *Nothofagus*) at an elevation of about 500m (Crowson 1966). An adult *R. daldiniae* was found in *Daldinia* sp. fungus growing on a dead tree (Crowson 1966). *Rentonium chilense* was collected in *Nothofagus* forest at around sea level.

Distribution. New Zealand: Canterbury, Waimate. South Chile: Isla Bertrand.

Species:

chilense Crowson, 1970; Chile (RAC)

Crowson, R. A. 1970: 7. Kolibáč, J. 2005: 81 (redescription)

daldiniae Crowson, 1966; New Zealand (RAC)

Crowson, R. A. 1966: 121, 123 (supposed larva). Crowson, R. A. 1970: 7. Kolibáč, J. 2005: 81 (redescription). Kolibáč, J. 2006: 109

Genus *Thymalus* Latreille, 1802
http://species-id.net/wiki/Thymalus
Figs 10, 16, 18; Map 10

Latreille, 1802: 133.

Type species. *Peltis brunnea* Thunberg, 1794 (= *Cassida limbata* Fabricius, 1787) [by original designation and monotypy]

Léveillé, A. 1910: 32. Barron, J. R. 1971: 35. Crowson, R. A. 1964a: 296. Kolibáč, J. 2005: 85 (redescription). Kolibáč, J. 2006: 111 (phylogeny). Kolibáč, J. 2007a: 366. Nikitsky, N. B. et al. 1998: 29 (key). Lafer, G. Sh. 1992: 83. Reitter, E. 1876: 64.

Thymalops Iablokoff-Khnzorian,1962 [Type species: *Cassida limbata* Fabricius, 1787]

Barron, J. R. 1971: 35. Iablokoff-Khnzorian, S. M. 1962: 421.

Remarks. Comparing the larvae as well as adults of *Thymalus* and *Protopeltis*, I found some interesting similarities, which led me to consideration of their phylogenetic relationship. Later character analysis (Kolibáč 2006) showed a relationship of *Thymalus* and *Protopeltis* with the former Rentoniini Crowson, 1966. This in turn led to the establishment of the tribe Thymalini for the group. However, Crowson (1966, 1970) also associated the former monotypic tribe Protopeltini Crowson, 1966 with the rentoniins. Recently, such a classification was called into question by Lawrence et al. (2011) and Leschen et al. (2012), who found Trogossitidae polyphyletic in their character analyses; however, both analyses were based on the same character states. Their model genera *Thymalus* and *Rentonellum* are classified outside Cleroidea in Lawrence et al. (2011) trees whereas Leschen et al. (2012), using a restricted character set, removed them only from Trogossitidae and/or suggested subfamily rank for rentoniins again, without necessarily believing in a mutual relationship between the two genera. Some more detail appears in "Remarks" with the tribe Thymalini.

Léveillé (1877) described the Caucasian species *Thymalus aubei* as *T. fulgidus* var. *aubei* Léveillé, 1877. However, *Thymalus fulgidus* Erichson, 1844 was originally described from North America and Barron (1971) synonymized this species with *T. marginicollis* Chevrolat, 1842. That is perhaps why the latter author also synonymized the taxon *aubei* as a synonym of *marginicollis*, probably without examination of the holotype or even Caucasian specimens. Russian entomologists, for example Nikitsky et al. (1998), consider *T. aubei* a valid species, with the synonym *T. subtilis* Reitter, 1889.

Description. Body size: 4.3–7.5 mm. Body shape convex (not conglobate). Gular sutures wide, subparallel. Frontoclypeal suture absent. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum: ctenidium absent. Antennal groove absent. Eyes: size large, lateral. Eyes number: two. Epicranial acumination moderate. Lacinial hooks: two. Galea: shape elongate. Galea: ciliate setae absent. Mediostipes-Lacinia not fused. Palpifer: outer edge even. Mandibular apical teeth number: two, horizontally situated. Mola present. Penicillus (at base) absent. Pubescence above mola or cutting edge absent. Ventral furrow absent. Basal notch moderate. Labrum-Cranium not fused. Epipharyngial sclerite absent. Lat-

eral tormal process: projection projection not developed (all remaining). Ligula: ciliate setae absent. Ligula rigid, not retroflexed, weakly emarginate. Hypopharyngeal sclerite H-shaped. Antenna 11-segmented. Antennal club symmetrical, sensorial fields absent. Front coxal cavities externally open, internally closed. Pronotum transverse. Prepectus absent. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron wide. Elytral interlocking mechanism absent, carinae reduced. Elytral punctation regular, scales absent. Wing: radial cell oblong (or reduced), wedge cell present, cross vein MP3-4 present, cross vein AA1+2-3+4 absent. Front tibiae: spines along side reduced. Hooked spur absent, apical spurs not hooked or weakly hooked. Claws: denticle absent. Parasternites number along ventrites III–VII: one. Spiculum gastrale absent. Tegmen composed of three parts.

Larva: Frontal arms V-shaped. Epicranial stem reduced. Endocarina absent. Gular sutures inconspicuous. Gula: anterior apodemes present. Paragular sclerites absent. Hypostomal rods present. Stemmata number: five. Mandibular apical teeth number: two, horizontally situated. Lacinia mandibulae with several small spines. Mola absent. Maxillary palpi 3-segmented. Palpifer present. Pedunculate seta absent. Mala simple. Mala: bidentate protrusion present. Cardo-Stipes partially fused. Cardo: size much smaller than stipes. Ligula present. Labial palpi 2-segmented. Prementum in single part, anterior margin even. Torma: two separate lateral sclerites. Antennal joints 1, 2 transverse. Sensory appendix larger than half of joint 3. Thoracic sclerites pattern (dorsally) 2-0-0. Thoracic sclerites pattern (ventrally) 0+0+0. Trochanter triangular. Abdominal segment IX not divided. Tergite IX flat. Urogomphi present, hooked; median process absent.

Biology. The beetles are not associated with any particular tree species and are found on both deciduous and coniferous trees. *Thymalus limbatus* is known from the trunks of birch, beech, linden, and spruce, mostly under bark. It is assumed that the larvae feed on fungi in rotten or decaying wood (Kolibáč et al. 2005). *Thymalus marginicollis* has been collected from the fungi *Polyporus betulinus*, *P. versicolor*, *Daedalea confragosa*, on the trunks of birch and also on "*wild flowers in plant press*" (Barron 1971).

Distribution. Holoarctic: Northern states of USA, Canada, Europe, North Africa, Siberia to China and Japan. Some specimens, probably a new species, have recently been collected in Chinese Sichuan and Yunnan and also in northern Thailand.

Species:

aubei Léveillé, 1877; "Batum", Caucasus (varA)

Léveillé, A. 1910: 32. Klausnitzer, B. 1996: 156. Barron, J. R. 1971: 36 (syn. *Thymalus aubei* Léveillé, 1877 with *T. marginicollis* Chevrolat, 1842). Barron, J. R. 1971: 36 (syn. *Thymalus fulgidus* var. *aubei* Léveillé, 1877 with *T. marginicollis* Chevrolat, 1842). Kolibáč, J. 2007a: 366 (syn. *Thymalus subtilis* Reitter, 1889). Lafer, G. Sh. 1992: 86 (*Thymalus subtilis* Reitter, 1889). Léveillé, A. 1910: 33 (*Thymalus subtilis* Reitter, 1889). Nikitsky, N. B. et al. 1998: 28 (syn. *Thymalus subtilis* Reitter, 1889; lectotype designated). Nikitsky, N. B. & Semenov, V. B. 2001: 49

chinensis Fairmaire, 1900; China: Fujian (JK)
Léveillé, A. 1910: 32. Kolibáč, J. 2007a: 366
laticeps Lewis, 1894; Japan (varA)
Léveillé, A. 1910: 32. Esaki, T. et al. 1951: 1063. Kolibáč, J. 2007a: 366. Lafer, G. Sh. 1992: 86. Nakane, T. et al. 1963: 181
limbatus Fabricius, 1787; Europe, North Africa: Tunisia (JK)
Léveillé, A. 1910: 32. Alexander, K. N. A. 1996: 90 (biology). Bahillo de la Puebla, P. & López-Colón, J. I. 1999: 13. Bahillo de la Puebla, P. & López-Colón, J. I. 2004: 129. Bercedo, P. et al. 2006: 180 (distribution). Borowiec, L. 1983: 15. Burakowski, B. et al.1986: 123. Cunev, J. 1999: 76. Franz, H. 1981: 51–52 (distribution). Klausnitzer, B. 1976: 8. Klausnitzer, B. 1978: 176. Klausnitzer, B. 1996: 155. Kolibáč, J. 1993a: 20. Kolibáč, J. 1993b: 90. Kolibáč, J. 2002: 55 (larva). Kolibáč, J. 2005: 85 (redescription). Kolibáč, J. 2006: 110 (larva). Kolibáč, J. 2007a: 366 (distribution). Kolibáč, J. 2007a: 366 (syn. *brunneus* Thunberg, 1794). Kolibáč, J. 2007a: 366 (syn. *rubiginosus* Gmelin, 1790). Krasutskii, B. V. 1996: 274. Mitter, H. 1998: 561. Pileckis, S. & Monsevičius, V. 1995: 273. Ratti, E. 1997: 178. Reitter, E. 1876: 64. Theunert, R. 2006: 113–114 (distribution). Vogt, H. 1967: 18
marginicollis Chevrolat, 1842; Canada, USA (JRB)
Barron, J. R. 1971: 36 (syn. *Thymalus aubei* Léveillé, 1877). Barron, J. R. 1971: 36 (syn. *Thymalus fulgidus* Erichson, 1844). Barron, J. R. 1971: 36 (syn. *Thymalus fulgidus* var. *aubei* Léveillé, 1877). Böving, A. G. & Craighead, F. C. 1931: 273 (larva). Dajoz, R. 1997: 44 (biology). Reitter, E. 1876: 64 (*Thymalus fulgidus* Erichson, 1844: "Amer. bor.")
oblongus Reitter, 1889; Russia: North and Central Europea teritorries, Sweden, East Siberia (JK)
Léveillé, A. 1910: 33. Lafer, G. Sh. 1992: 86. Kolibáč, J. 2007a: 366. Krasutskii, B. V. 2006: 763 (biology). Nikitsky, N. B. et al. 1998: 28 (lectotype designated)
parviceps Lewis, 1894; Japan (varA)
Léveillé, A. 1910: 33. Esaki, T. et al. 1951: 1063. Kolibáč, J. 2007a: 366. Lafer, G. Sh. 1992: 86. Nakane, T. et al. 1963: 181
punctidorsum Latreille, 1894; Japan (varA)
Léveillé, A. 1910: 33. Kolibáč, J. 2007a: 366. Lafer, G. Sh. 1992: 86. Nakane, T. et al. 1963: 181

Subfamily Lophocaterinae Crowson, 1964

Crowson, R. A. 1964a: 297 (Lophocaterinae).
Barron, J. R. 1971: 11, 12 (syn. Lophocateridae = Peltinae). Burakowski, B. et al. 1986: 119 (Lophocateridae). Crowson, R. A. 1970: Hunt, T. et al. 2007: 1915 (molecular phylogeny). Klausnitzer, B. 1996: 145. Kolibáč, J. 2006: 125 (diagno-

sis). Kolibáč, J. & Zaitsev, A. A. (2010): 55 (subfamily status suggested). Lawrence, J. F. & Newton, A. F., Jr. 1995: 868 (Kirby, W. 1837: 104 is considered the author of the family rank name). Ślipiński, S. A. 1992: 442 (Lophocaterinae Crowson, 1964).

Remarks. The subfamily Lophocaterinae was established by Crowson (1964a) in Trogossitidae (minus Peltidae) and later re-classified at family rank (Crowson 1970). As Crowson remarked (1970: 9), "*the group is very distinct from Peltidae in larval structure, but not easily separable from that family by skeletal characters of the adults; the larvae show apparent affinities to Trogossitidae* [...], *from which Lophocateridae are easily separable by characters of the adults.*" This is exactly the reason why taxonomists sometimes consider lophocaterins (the tribe cluster Decamerini-Lophocaterini-Ancyronini in this context) relatives of Peltinae, and sometimes Trogossitinae. The results of my two character analyses are also uncertain. In Kolibáč (2006), lophocaterins are unambiguously determined as a sister group of Peltinae but the improved analysis (Kolibáč 2008) is not so definitive. The second analysis resulted in 48 most parsimonious trees of which 16 supported a sister relationship between the lophocaterins and Trogossitinae but 32 trees supported a relationship with Peltinae. Further, molecular analyses published by Hunt et al. (2007), Bocáková et al. (2011) and Gunter et al. (2013) show closer relationships between a number of representatives of Peltinae and the lophocaterins than the latter and Trogossitinae. We may therefore consider the sister relationship Lophocaterinae-Peltinae more probable than Lophocaterinae-Trogossitinae. However, it is better to use subfamily rank for all three monophyletic clades to avoid a peltine polyphyly. This has already been explained by Kolibáč and Zaitsev (2010) in detail: "*There are three monophyletic branches in modern morphological analyses of Trogossitidae: (1) the subfamily Trogossitinae, (2) the tribe cluster Decamerini-Lophocaterini-Ancyronini, and (3) the subfamily Peltinae* sensu stricto *(Peltini-?Phloiophilini-Colydiopeltini-Thymalini). A sister relation of the lophocaterine cluster and Peltinae* s.str. *as recognized by Kolibáč (2006) and Hunt* et al. *(2007) was called into question by Kolibáč (2008) and by results of the present communication. Therefore, to rule out the potential polyphyly of Peltinae* s.lat. (sensu *Kolibáč 2006), we recommend to refer* [sic] *the tribe cluster Decamerini-Lophocaterini-Ancyronini again* [sic] *as the separate subfamily Lophocaterinae as aforementioned* [sic] *by Kolibáč (2008: 125).*"

Key to tribes of Lophocaterinae

1 Tarsal claws with denticle. Larva: median process between urogomphi absent ..... **Decamerini**

– Tarsal claws without denticle. Larva: median process between urogomphi present 2

2 Penicillus mostly composed of tuft of long setae. Frontoclypeal suture absent or weak and straight ..... **Ancyronini**

– Penicillus membranous or composed of short, fine setae. Frontoclypeal suture conspicuous, mostly broadly emarginate ..... **Lophocaterini**

† Genus *Cretamerus* Peris, Kolibáč & Delclòs (in press)
http://species-id.net/wiki/Cretamerus
Map 11

Peris D., Kolibáč J. & Delclòs X. (in press): iii.

Type species. † *Cretamerus vulloi* Peris, Kolibáč & Delclòs, (in press) [by monotypy and author's designation]

Remarks. The fossil is the oldest known record confirmed for the entire superfamily Cleroidea on the European continent. Due to the fine state of preservation, certain morphological character states of the fossil were inserted into a character matrix of Trogossitidae genera. The resulting tree reveals the basal position of *Cretamerus vulloi* within the lophocaterine clade. It may form an extinct branch of the recent Decamerini.

In view of its fine state of preservation, certain morphological character states of the fossil to be inserted into a character matrix of Trogossitidae genera. The resulting tree reveals the basal position of *Cretamerus vulloi* within the lophocaterine clade. It may form an extinct branch of the recent Decamerini.

Original diagnosis. Body very small, less than 2 mm. Antenna 10-segmented, 3-segmented club nearly symmetrical. Prothorax with dentate lateral margin; procoxal cavities externally closed. Elytra without carinae, punctation irregular or less than obviously regular. Tibiae with two straight (i.e. not hooked) spurs. Abdomen with six visible ventrites.

Distribution. France: Charente-Maritime (Fouras/Bois-Vert); Cretaceous: early Cenomanian.

Species:

† *Cretamerus vulloi* Peris, Kolibáč & Delclòs (in press); France; Cretaceous (AD)
Peris D., Kolibáč J. & Delclòs X. (in press): iii

Tribe Decamerini Crowson, 1964

Crowson, R. A. 1964a: 287.

Type genus: *Decamerus* Solier, 1849

Barron, J. R. 1975: 12 (syn. Decamerinae = Peltinae). Kolibáč, J. 2006: 127 (diagnosis, stat. n.). Lawrence, J. F. & Newton, A. F., Jr. 1995: 868 (Decamerinae). Ślipiński, S. A. 1992: 442, 460 (key) (Decamerinae).

Remarks. Since it was established (Crowson 1964a), Decamerinae has always been connected with Peltidae (= Peltinae) in the works of a variety of authors. Unfortunately, the single larva described to date (Crowson 1964a) was not associated with adults. It possesses some general features of Lophocaterinae (mandible with long lacinia mandibulae, cranium with characteristic gular area) but it differs in having curved (cucujoid) frontal arms and in the absence of a median process between the urogomphi. The larva of *Eronyxa expansus* is evidently lophocaterine (Tait et al. 1990);

however, the adults of *Eronyxa* and the present decamerins are similar in morphology and chiefly of floricolous habit. Two character analyses (Kolibáč 2006, 2008) placed *Eronyxa* on the border between Lophocaterini and Decamerini. Although the latter genus is classified within Lophocaterini herein, I feel its true relationship lies with Decamerini. This issue should be re-examined, although not before an indisputable larva of Chilean Decamerini is found and/or reared.

Key to genera

1 Front coxal cavities completely externally closed; tarsal claws split into two almost identical parts ..... ***Antixoon***
– Front coxal cavities externally open or not completely closed; tarsal claws with large denticle (but shorter than outer claw) **2**
2 Antenna 10-segmented; tegmen composed of one part; front coxal cavities open (or closed to 3/4) ..... ***Decamerus***
– Antenna 11-segmented; tegmen composed of three parts; front coxal cavities nearly closed ..... ***Diontolobus***

Genus *Antixoon* Gorham, 1886
http://species-id.net/wiki/Antixoon
Map 11

Gorham, H. S. 1886: 332.

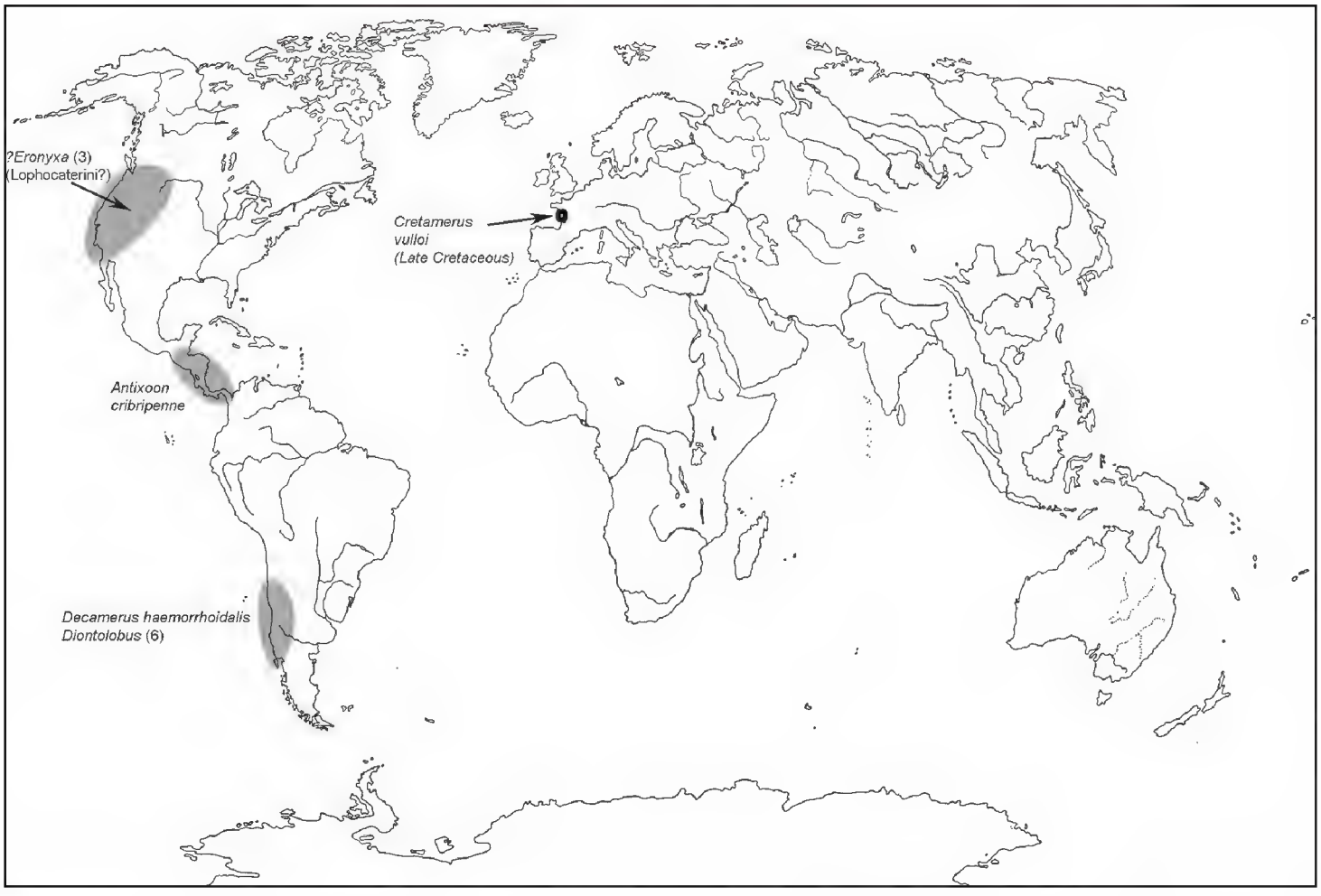
Type species. *Antixoon cribripenne* Gorham, 1886 (*sub* Melyridae) [by monotypy] (not included in Léveillé 1910).

Crowson, R. A. 1964a: 291 (key). Kolibáč, J. 2005: 47. Kolibáč, J. 2006: 116 (phylogeny).

Remarks. In consideration of a recent re-classification of *Eronyxa* within Lophocaterini (Tait et al. 1990), the systematic position of *Antixoon* needs to be checked. However, the bifid tarsal claws correspond with Crowson's (1964a) opinion about a close relationship between *Antixoon*, *Diotolobus* and *Decamerus*.

Description. Body size: about 3.0 mm. Body shape flat. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Antennal groove absent. Eyes number: two. Mola present. Penicillus (at base) absent. Pubescence above mola or cutting edge absent. Ventral furrow present. Basal notch moderate. Labrum-Cranium not fused. Antennal club symmetrical, sensorial fields absent. Front coxal cavities externally closed. Pronotum transverse. Elytra: long hairs absent. Claws: denticle distinct.

Biology. Floricolous: "*collected in the flowers of bushes in more or less open country*" Crowson (1964a).



Map 11. A distribution of the tribe Decamerini including the newly described genus † *Cretamerus*. A position of *Eronyxa* is indicated.

Distribution. (Map 11.) Central America: Panama.

Species:

cribripenne Gorham, 1886; Central America (Panama) (RAC)

Gorham, H. S. 1886: 332

Genus *Decamerus* Solier, 1849

http://species-id.net/wiki/Decamerus

Figs 10, 18; Map 11

Solier, A. J. J. 1849: 369.

Type species. *Decamerus haemorrhoidalis* Solier, 1849 [by monotypy]

Léveillé, A. 1910: 28. Crowson, R. A. 1964a: 291. Kolibáč, J. 2005: 52 (redescription). Kolibáč, J. 2006: 111 (phylogeny).

Peltostoma Reitter, 1877 [Type species: *Peltostoma unguicularis* Reitter, 1877; by monotypy]

Léveillé, A. 1910: 28 (synonymized?). Reitter, E. 1877: 173.

Description. Body size: about 3.0 mm. Body shape flat. Gular sutures wide, convergent at apex. Frontoclypeal suture present. Frons: longitudinal groove or depression

absent. Cranium ventrally: tufts of long setae at sides absent. Submentum: ctenidium absent. Antennal groove absent. Eyes: size large, lateral. Eyes number: two. Epicranial acumination absent. Lacinial hooks absent. Galea: shape elongate. Galea: ciliate setae absent. Mediostipes-Lacinia partially fused. Palpifer: outer edge even. Mandibular apical teeth number: two, horizontally situated. Mola present. Penicillus (at base) present (fine, often membranous). Pubescence above mola or cutting edge absent. Ventral furrow present. Basal notch shallow or absent. Labrum-Cranium not fused. Epipharyngial sclerite absent. Lateral tormal process: projection projections extending laterally and downwards (*Eronyxa*). Ligula: ciliate setae absent. Ligula membranous, not retroflexed, deeply emarginate. Hypopharyngeal sclerite H-shaped. Antenna 10-segmented. Antennal club weakly asymmetrical, sensorial fields absent. Front coxal cavities externally open, internally open. Pronotum transverse. Prepectus present. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron thin. Elytral interlocking mechanism absent, carinae reduced. Elytral punctation irregular, scales absent. Wing: radial cell moved down, often small, wedge cell absent, cross vein MP3-4 absent, cross vein AA1+2-3+4 absent. Front tibiae: spines along side moderate. Hooked spur absent, apical spurs not hooked or weakly hooked. Claws: denticle distinct. Parasternites number along ventrites III–VII: absent. Spiculum gastrale absent. Tegmen composed of only a single part.

Biology. The species occur on the flowers of various bushes. Floricolous, found together with *Diontolobus*.

Distribution. Central part of Chile, approximately regions IV to VI.

Species:

haemorrhoidalis Solier, 1849; Chile (AL)

Léveillé, A. 1910: 28. Kolibáč, J. 2005: 52 (redescription). Reitter, E. 1877: 174 (syn. *Peltostoma unguicularis* Reitter, 1877; synonymized by Léveillé 1910?)

Genus *Diontolobus* Solier, 1849

http://species-id.net/wiki/Diontolobus

Fig. 10; Map 11

Solier, A. J. J., 1849: 367.

Type species. *Diontolobus punctipennis* Solier, 1849 [by monotypy]

Léveillé, A. 1910: 27. Crowson, R. A. 1964a: 291. Kolibáč, J. 2005: 53 (redescription). Kolibáč, J. 2006: 111 (phylogeny).

Micropeltis Redtenbacher, 1867 [Type species: *Micropeltis serraticollis* Redtenbacher, 1867; by monotypy]

Léveillé, A. 1910: 27 (synonymized?). Reitter, E. 1876: 58.

Description. Body size: about 3.0–4.0 mm. Body shape flat. Gular sutures wide, convergent at apex. Frontoclypeal suture present. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum: ctenidium absent. Antennal groove absent. Eyes: size large, lateral. Eyes number: two. Epicra-

nial acumination absent. Lacinial hooks absent. Galea: shape sub-clavate. Galea: ciliate setae absent. Mediostipes-Lacinia not fused. Palpifer: outer edge even. Mandibular apical teeth number: two, horizontally situated. Mola present. Penicillus (at base) present (fine, often membranous). Pubescence above mola or cutting edge present. Ventral furrow present. Basal notch moderate. Labrum-Cranium not fused. Epipharyngial sclerite absent. Lateral tormal process: projection projection curved upwards (*Colydiopeltis*). Ligula: ciliate setae absent. Ligula membranous, not retroflexed, deeply emarginate. Hypopharyngeal sclerite H-shaped. Antenna 11-segmented. Antennal club weakly asymmetrical, sensorial fields absent. Front coxal cavities externally closed, internally open. Pronotum transverse. Prepectus present. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron thin. Elytral interlocking mechanism absent, carinae reduced. Elytral punctation irregular, scales absent. Wing: radial cell moved down, often small, wedge cell absent, cross vein MP3-4 absent, cross vein AA1+2-3+4 absent. Front tibiae: spines along side moderate. Hooked spur absent, apical spurs not hooked or weakly hooked. Claws: denticle distinct. Parasternites number along ventrites III–VII: absent. Spiculum gastrale absent. Tegmen composed of three parts.

Larva: Frontal arms curved (cucujoid). Epicranial stem absent. Endocarina absent. Gular sutures conspicuous , parallel. Paragular sclerites absent. Hypostomal rods absent. Stemmata number: five. Mandibular apical teeth number: two, horizontally situated. Lacinia mandibulae plumose. Mola present. Maxillary palpi 3-segmented. Pedunculate seta absent. Mala simple. Cardo-Stipes not fused. Ligula present. Labial palpi 2-segmented. Prementum in single part. Antenna 1st transverse, 2nd elongate. Sensory appendix medium sized (to half of joint 3). Thoracic sclerites pattern (dorsally) 0+0+0. Abdominal segment IX not divided. Tergite IX flat. Urogomphi present, hooked; median process absent.

Biology. The species occur on flowers. Pollen grains were found in the gut of *Diontolobus punctipennis* (Crowson 1964a).

Distribution. As same as in *Decamerus*, the central part of Chile, approximately regions IV to VI.

Species:

costulata Reitter, 1876; Chile (AL)

Léveillé, A. 1910: 27. Reitter, E. 1876: 60 (*Micropeltis costulata* Reitter, 1876)

flavolimbata Reitter, 1877; Chile (AL)

Léveillé, A. 1910: 27

inaequalis Reitter, 1877; Chile (AL)

Léveillé, A. 1910: 28

incostata Reitter, 1876; Chile (AL)

Léveillé, A. 1910: 28. Reitter, E. 1876: 59 (*Micropeltis incostata* Reitter, 1876)

lanuginosa Léveille, 1895; Chile (AL)

Léveillé, A. 1910: 28

punctipennis Solier, 1849; Chile (AL)

Léveillé, A. 1910: 28. Kolibáč, J. 2005: 53 (redescription). Reitter, E. 1876: 59 (syn. *Micropeltis serraticollis* Redtenbacher, 1867, synonymized by Léveillé 1910?)

punctipennis var. *lateritius* Fairmaire, 1883: 488
Diontolobus sp. (supposed larva); Chile (RAC)
Crowson, R. A. 1964a: 291. Kolibáč, J. 2006: 106

Tribe *Ancyronini* Kolibáč, 2006

Kolibáč, J. 2006: 127.

Type genus. *Ancyrona* Reitter, 1876 [designated by Kolibáč 2006]
Kolibáč, J. 2007a: 365. Kolibáč, J. & Zaitsev, A. A. 2010: 59 (phylogeny, larval morphology).

Remarks. Ancyronini are undeniably related to Lophocaterini. As observations made upon the recently recorded *Ancyrona diversa* larva have shown (Kolibáč and Zaitsev 2010), the major morphological features of known larvae of the two tribes are nearly identical. In fact, it is likely that *Ancyrona* and allied genera are simply "advanced lophocaterins" adapted to a predatory way of life. Such a life-style is clearly demonstrated by their carnivorous mouthparts in both adults and larvae (sharp mandibles without mola), different life habits (they dwell on bark, branches or logs hunting for other insects) and well as their excellent capacity for rapid flight and swift reactions to intrusive stimuli. From the point of view of phylogenetic taxonomy, it appears that Lophocaterini are paraphyletic in relation to Ancyronini; both tribes are therefore in acute need of further study.

Key to genera

1 Head quite hypognathous; tarsal pattern 4-4-4 or 5-5-5; body convex..... **2**
– Head quite prognathous; tarsal pattern 5-5-5; body more/less flattened..... **3**
2 Antennae 10- or 11-segmented with loose 3-segmented club; mandible with penicillus formed by membranous appendage with short setae; eyes distinctly elevate..... ***Afrocyrona***
– Antennae 10-segmented with compact 2-segmented club, segments 9 and 10 coalescent; mandible with penicillus composed of tuft of long setae; eyes not very elevate ..... ***Neaspis***
3 Eyes distinctly elevate; labrum sometimes fused with cranium (males); lacinia without hooked spurs; mediostipes fused with lacinia **4**
– Eyes not very elevate; labrum free; lacinia with hooked pigmented spurs; mediostipes not fused with lacinia ..... ***Ancyrona***
4 Mandible enlarged, male mandible monstrous; galea and lacinia without spines..... ***Leptonyxa***
– Mandible not enlarged; lacinia with several pale spines ..... ***Grynoma***

Genus *Afrocyrona* Kolibáč, 2007
http://species-id.net/wiki/Afrocyrona
Fig. 10; Map 12

Kolibáč, J. 2007b: 60.

Type species. *Afrocyrona dwesae* Kolibáč, 2007 [designated by Kolibáč 2007b]

Description. Body size: 2.9–5.0 mm. Body shape flat. Gular sutures narrow, subparallel at apex. Frontoclypeal suture present. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides present. Submentum: ctenidium absent. Antennal groove present. Eyes: size large, lateral. Eyes number: two. Epicranial acumination absent. Lacinial hooks: two. Galea: shape sub-clavate. Galea: ciliate setae absent. Mediostipes-Lacinia partially fused. Palpifer: outer edge even. Mandibular apical teeth number: two, horizontally situated. Mola absent. Penicillus (at base) long setae. Pubescence above mola or cutting edge absent. Ventral furrow absent. Basal notch shallow or absent. Labrum-Cranium not fused. Epipharyngial sclerite absent. Lateral tormal process: projection projection not developed (all remaining). Ligula: ciliate setae absent. Ligula membranous, not retroflexed, weakly emarginate. Hypopharyngeal sclerite H-shaped. Antenna 11-segmented or 10-segmented. Antennal club weakly asymmetrical, sensorial fields absent. Front coxal cavities externally open, internally open. Pronotum transverse. Prepectus present. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron moderate. Elytral interlocking mechanism absent, carinae conspicuous. Elytral punctation regular, scales present. Wing: radial cell oblong (or reduced) or cell moved down, often small, wedge cell absent, cross vein MP3-4 present, cross vein AA1+2-3+4 absent. Front tibiae: spines along side moderate. Hooked spur present. Tarsal pattern 4-4-4 or 5-5-5. Claws: denticle absent. Parasternites number along ventrites III–VII: one. Spiculum gastrale absent. Tegmen composed of two parts. Coxitae divided.

Biology. The species were collected by beating branches and sifting rotten wood and litter. Detritus and some insect remnants were found in the gut of *A. dwesae*, whereas only insect fragments were found in the gut of *A. ciskeiensis*. The species are probably predatory and partly or occasionally fungivorous. *Afrocyrona dwesae* may be unable to fly.

Distribution. Three described species are known from South Africa: Eastern Cape and Transvaal. One or two more species have been recently found in the island of Sokotra.

Species:

ciskeiensis Kolibáč, 2007; South Africa (JK)
Kolibáč, J. 2007b: 61

dwesae Kolibáč, 2007; South Africa (JK)
Kolibáč, J. 2007b: 63

gussmannae Kolibáč, 2007; South Africa (JK)
Kolibáč, J. 2007b: 64

Genus *Ancyrona* Reitter, 1876
http://species-id.net/wiki/Ancyrona
Figs 2, 11; Map 12

Reitter, E. 1876: 51.

Type species. *Ancyrona lewisi* Reitter, 1876 [designated by Kolibáč 1993]

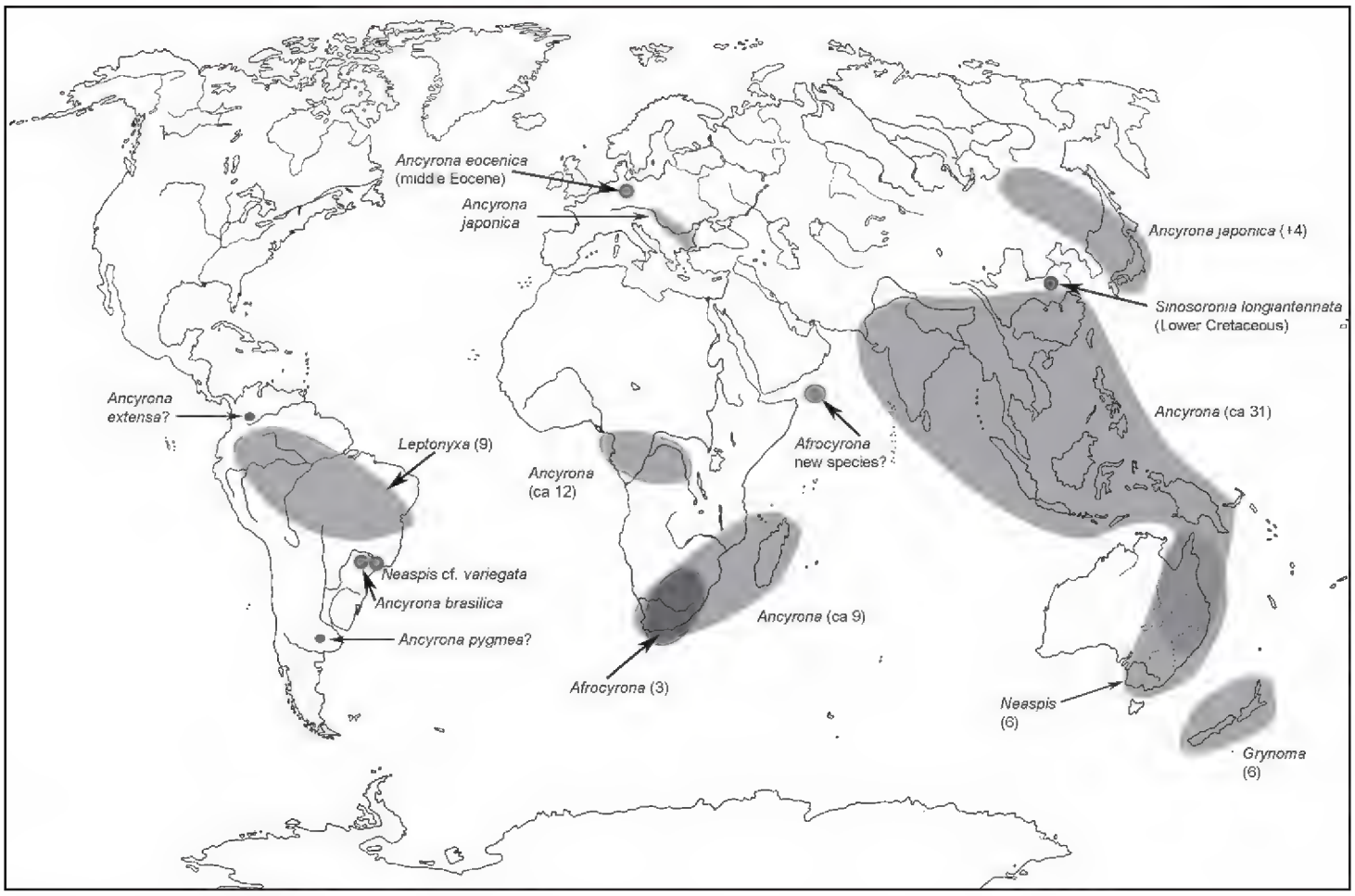
Léveillé, A. 1910: 25. Lafer, G. Sh. 1992: 83. Matthews, E. G. 1992: 3 (key, Australia). Kolibáč, J. 2005: 45. Kolibáč, J. 2006: 111 (phylogeny). Kolibáč, J. 2007a: 365. Kolibáč, J. & Zaitsev, A. A. (2010): 55 (larva).

Latolaeva Reitter, 1876 (Type species: *Latolaeva ferrarii* Reitter, 1876; designated by Kolibáč 2005)

Léveillé, A. 1910: 25. Kolibáč, J. 2005: 63. Kolibáč, J. 2006: 111 (phylogeny). Kolibáč 2007b: 54 (synonymized). Reitter, E. 1876: 49.

Description. Body size: 3.1–8.0 mm. Body shape flat. Gular sutures narrow, subparallel at apex. Frontoclypeal suture present or broadly emarginate. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides present. Submentum: ctenidium absent. Antennal groove present. Eyes: size large, lateral. Eyes number: two. Epicranial acumination absent. Lacinial hooks: two. Galea: shape sub-clavate. Galea: ciliate setae absent. Mediostipes-Lacinia not fused. Palpifer: outer edge even. Mandibular apical teeth number: two, horizontally situated. Mola absent. Penicillus (at base) long setae. Pubescence above mola or cutting edge absent. Ventral furrow absent. Basal notch shallow or absent. Labrum-Cranium not fused. Epipharyngial sclerite absent. Lateral tormal process: projection projection not developed (all remaining). Ligula: ciliate setae absent. Ligula membranous, not retroflexed, weakly emarginate. Hypopharyngeal sclerite H-shaped. Antenna 10-segmented. Antennal club weakly asymmetrical, sensorial fields absent. Front coxal cavities externally open, internally open. Pronotum transverse. Prepectus present. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron moderate. Elytral interlocking mechanism absent, carinae conspicuous. Elytral punctation regular, scales present. Wing: radial cell oblong (or reduced) or cell moved down, often small, wedge cell absent, cross vein MP3-4 present, cross vein AA1+2-3+4 absent. Front tibiae: spines along side moderate. Hooked spur present. Claws: denticle absent. Parasternites number along ventrites III–VII: one. Spiculum gastrale absent. Tegmen composed of two or three parts. Coxitae undivided.

Larva *A. diversa* Pic, 1921 (Kolibáč and Zaitsev 2010): Frontal arms Y-shaped. Epicranial stem minute, nearly absent. Endocarina present. Gular sutures conspicuous, convergent. Gula: anterior apodemes absent. Paragular sclerites absent. Hypostomal rods present. Stemmata number: two. Mandibular apical teeth number: two, horizontally situated. Lacinia mandibulae plumose. Mola absent. Maxillary palpi 3-segmented. Palpifer present. Pedunculate seta present. Mala simple. Mala: bidentate protrusion ab-



Map 12. A distribution of the tribe Ancyronini.

sent. Cardo-Stipes not fused. Cardo: size nearly as large as stipes. Ligula present. Labial palpi 2-segmented. Prementum in two parts, anterior margin even. Torma: two separate lateral sclerites and plate between them. Antennal joints 1, 2 elongate. Sensory appendix longer than half of joint 3. Thoracic sclerites pattern (dorsally) 1–2–0. Thoracic sclerites pattern (ventrally) 1–0–0. Trochanter oblong. Abdominal segment IX transversely divided. Tergite IX flat. Urogomphi present, hooked; median process present.

Biology. Predatory. Adults can be beaten from dry branches or individually collected on fallen timber, where they hunt for other insects.

Distribution. Africa in the south of Sahara, eastern Asia (from India to Japan and Russian Far East), Australia: Queensland, New South Wales (types of *A. aegra*, *A. amica*, *A. latebrosa*, *A. laticeps*, *A. vesca* checked), New Guinea (including undescribed species). Strangely enough, one Japanese species, *A. japonica*, was introduced to Europe and first recorded in Hungary ("Visegrad 1904"). It has now been collected several times in adjacent Slovakia, on branches of decaying oak. Two Tertiary fossil species are known from European Eocene.

Species groups. In a review of *Afrocyrona* and *Ancyrona*, I divided the latter genus in several informal species groups (Kolibáč 2007b). They are listed below together with a short diagnosis, although not all *Ancyrona* species are classified within the particular groups. This is only the first attempt to classify the rich and complex genus, so a monophyly of these groups should be checked and tried, then the groups may be established at the rank of subgenera).

lewisi species-group

Species. *lewisi*, *shibatai*, *haroldi*, and numerous undescribed species from south and eastern Asia and New Guinea.

Distribution. Japan, China, southeastern Asia.

Diagnosis. Small, flat, broad, oval species. Dorsal surface with colour pattern formed by scales or rigid decumbent setae.

gabonica species-group

Species. *gabonica*, *ferrarii*, *vicina*, *bivittata*, *feai*, *incensa*, *martini*, *plana*, and numerous undescribed species from eastern Asia and tropical Africa. Australian species *A. aegra*, *amica*, *latebrosa*, *laticeps*, *vesca* probably also belong to the group.

Distribution. Tropical Africa, south-eastern Asia and probably Australia.

Diagnosis. Extremely flat, broad, oval species without scales and lacking decumbent pubescence on dorsal surface; dorsal side quite bare or with inconspicuous or erect pubescence. Some species with longitudinal colour stripes on elytra; stripes not formed by pubescence or scales. Antennal club very loose, nearly serrate. Tegmen composed of two or three parts.

japonica species-group

Species. *japonica*, *diversa*.

Distribution. Japan, northern China, Ussuri. *Ancyrona japonica* also spread to south-eastern and central Europe (from Bulgaria through Hungary to Slovakia); first European record in 1904.

Diagnosis. Rather elongate unicolorous species with long, soft pubescence on dorsal surface. Tegmen composed of 1 or 2 parts (parameral piece fused with phallobase), male abdominal segments IX–X more or less reduced.

colobicoides species-group

Species. *colobicoides*, *fairmairei*, *kosnovskorum* (syn. *fairmairi*?), *minor*.

Distribution. Madagascar.

Diagnosis. Flat, elongate species with conspicuously elevate eyes and compact 3-segmented club. Yellowish elytra with dark black-brown pattern (stripes, spots), pubescence short and decumbent. Primitive tegmen composed of three parts. Elytra with distinct carinae. One specimen known to me from Madagascan copal (Cap d'Ambre).

***endroedyi* species-group**

Species. *endroedyi*, *muellerae*, *caffra*(?).

Distribution. South Africa.

Diagnosis. Body quite elongate (as in *japonica* group), with long, soft, erect hairs or short, decumbent, scale-like setae. Dorsal surface unicolorous or with pattern formed by pubescence. Radial cell completely or partly reduced. Tegmen composed of two or three parts. Elytra with more or less conspicuous carinae.

Species:

aegra Olliff, 1885; "Nov. Gal. mer." (AL)
Léveillé, A. 1910: 25

amica Olliff, 1885; S Australia (AL)
Léveillé, A. 1910: 25

andrewesi Léveillé, 1907; India (AL)
Léveillé, A. 1910: 25

aurora Léveillé, 1899; Congo gall. (AL)
Léveillé, A. 1910: 25

bivittata Léveillé, 1899; Cameroon (AL)
Léveillé, A. 1910: 25 (*Latolaeva bivittata* Léveillé, 1899). Kolibáč, J. 2007b: 55 (comb.; transferred from *Latolaeva* to *gabonica*-group)

blaisei Léveillé, 1907; Tonkin (AL)
Léveillé, A. 1910: 25

bouchardi Léveillé, 1902; Sumatra (AL)
Léveillé, A. 1910: 25

brasilica Perty, 1830; Brazil: Minas Geraes (AL)
Léveillé, A. 1910: 25 (*Latolaeva brasilica* Perty, 1830)
Note: Cleroidea? (see Reitter 1876: 51)

brunnea Léveillé, 1905; India (AL)
Léveillé, A. 1910: 25

brunneolimbata Léveillé, 1905; Fernando Po (AL)
Léveillé, A. 1910: 25

caffra Reitter, 1876; Cap (AL)
Reitter, E. 1876: 52. Léveillé, A. 1910: 25

cassidoides Reitter, 1876; Malacca (AL)
Léveillé, A. 1910: 25 (*Latolaeva cassidoides* Reitter, 1876). Reitter, E. 1876: 50 (*Latolaeva cassidoides* Reitter, 1876)

ciliata Murray, 1867; Old Calabar (Nigeria) (AL)
Léveillé, A. 1910: 25 (transferred from *Peltis* to *Ancyrona*). Reitter, E. 1876: 53 (*Peltis*)

colobicoides Fairmaire, 1868; Madagascar (AL, confirmed JK)
Léveillé, A. 1910: 30 (*Ostoma* (s.str.)). Kolibáč, J. 2007b: 57 (comb.; transferred from *Ostoma* to *colobicoides*-group)
Note: maybe conspecific with *A. kosnovskorum*

congolensis Léveille, 1905; Congo gall. (AL)
Léveillé, A. 1910: 26
crenata Murray, 1867; Old Calabar (Nigeria) (AL)
Léveillé, A. 1910: 26. Reitter, E. 1876: 54 (*Peltis*)
diversa Pic, 1921; E Siberia (Ussuri) (JK)
Pic, M. 1921: 1 (*Ostoma*). Kolibáč, J. 1993a: 17 (comb.; transferred from *Ostoma* to *Ancyrona*). Kolibáč, J. 1999b: 12 (morphology). Kolibáč, J. 2007a: 365 (distribution). Kolibáč, J. 2007b: 56 (shifted to *japonica*-group). Kolibáč, J & Zaitsev, A. A. 2010: 53 (larva)
elongata Léveille, 1905; India (AL)
Léveillé, A. 1910: 26
endroedyi Kolibáč, 2007; SA: Transvaal (JK)
Kolibáč, J. 2007b: 58
† *eocenica* Schmied, Wappler & Kolibáč, 2009; Germany; Tertiary: middle Eocene
Schmied, H. et al. 2009: 18
extensa Reitter, 1877; Bolivia: Bogota (AL)
Léveillé, A. 1910: 26
fairmairei Léveillé, 1903; Madagascar (AL, confirmed JK)
Léveillé, A. 1910: 30 (*Ostoma* (s.str.)). Kolibáč, J. 2007b: 58 (comb.; transferred from *Ostoma* to *colobicoides*-group)
feai Léveillé, 1905; Congo gall., Cameroon (AL)
Léveillé, A. 1910: 26. Kolibáč, J. 2007b: 55 (shifted to *Ancyrona gabonica*-group)
ferrarii Reitter, 1876; Batchian Ins. (AL)
Léveillé, A. 1910: 25 (*Latolaeva*). Kolibáč, J. 2005: 63 (*Latolaeva*; redescription). Kolibáč, J. 2007b: 55 (comb.; transferred from *Latolaeva* to *gabonica*-group). Reitter, E. 1876: 50 (*Latolaeva*)
francoisi Léveillé, 1907; Tonkin (AL)
Léveillé, A. 1910: 26
fryi Léveillé, 1899; Assam, Perak, Sumatra (AL)
Léveillé, A. 1910: 26
gabonica Léveillé, 1899; Congo gall. (AL)
Léveillé, A. 1910: 26. Kolibáč, J. 2007b: 55 (shifted to *gabonica*-group)
gestroi Reitter, 1880; Australia, New Guinea (AL)
Léveillé, A. 1910: 26
grouvellei Léveille, 1899; Détr. Torres (AL)
Léveillé, A. 1910: 26
haroldi Reitter, 1877; Japan (AL, confirmed JK)
Léveillé, A. 1910: 26. Esaki, T. et al. 1951: 1062. Kolibáč, J. 2007a: 365. Kolibáč, J. 2007b: 54 (shifted to *lewisi*-group). Nakane, T. et al. 1963: 181
higonia Lewis, 1894; Japan (AL)
Nakane, T. et al. 1963: 182 (*Ostoma*)
Note: combined with *Ancyrona* here according to a photograph in Nakane, T. et al. (1963)

horni Léveillé, 1902; Sri Lanka (AL)
Léveillé, A. 1910: 26
incensa Oliff, 1883; Malacca (AL)
Léveillé, A. 1910: 25 (*Latolaeva*). Kolibáč, J. 2007b: 55 (comb.; transferred from *Latolaeva* to *gabonica*-group
indica Léveillé, 1907; India (AL)
Léveillé, A. 1910: 26
japonica Reitter, 1889; Asia: Japan; Europe: Bulgaria?, Czechia, Hungary (JK)
Reitter, E. 1889: 15 (*Ostoma*). Léveillé, A. 1910: 31 (*Ostoma*). Esaki, T. et al. 1951: 1062 (*Grynocharis*; comb.). Kolibáč, J. 1993a: 18 (comb.; transferred from *Grynocharis* to *Ancyrona*). Kolibáč, J. 1993b: 90 (check-list). Kolibáč, J. 1999: 12 (morphology). Kolibáč, J. 2007a: 365 (distribution). Kolibáč, J. 2007b: 56 (shifted to *japonica*-group). Lafer, G. Sh. 1992: 84 (*Grynocharis*). Nakane, T. et al. 1963: 182 (*Grynocharis*)
javanica Léveille, 1905; Java (AL)
Léveillé, A. 1910: 26
kosnovskorum Kolibáč, 2005; Madagascar (JK)
Kolibáč, J. 2005: 46. Kolibáč, J. 2007b: 58 (shifted to *colobicoides*-group)
Note: maybe synonym of *A. colobicoides*
lanuginosa Motschulsky, 1863; Sri Lanka (AL)
Léveillé, A. 1910: 26. Reitter, E. 1876: 52
latebrosa Olliff, 1885; Queensland (AL)
Léveillé, A. 1910: 26
laticeps Olliff, 1885; Queensland, Nov. Gall. mer. (=NSW?) (AL)
Léveillé, A. 1910: 26
lewisi Reitter, 1876; Japan (AL)
Léveillé, A. 1910: 26. Kolibáč, J. 1993a: 16. Kolibáč, J. 2005: 45. Kolibáč, J. 2007b: 54 (shifted to *lewisi*-group). Lafer, G. Sh. 1992: 84. Reitter, E. 1876: 52
maculipennis Kraatz, 1878; S Africa (AL)
Léveillé, A. 1910: 26
martini Léveille, 1899; Natal (AL)
Léveillé, A. 1910: 26. Kolibáč, J. 2007b: 55 (shifted to *gabonica*-group)
minor Fairmaire, 1900; Madagascar (AL)
Léveillé, A. 1910: 31 (*Ostoma* (s.str.)). Kolibáč, J. 2007b: 58 (comb.; transferred from *Ostoma* to *colobicoides*-group)
muellerae Kolibáč, 2007; SA: Transvaal (JK)
Kolibáč, J. 2007b: 59 (*Ancyrona endroedyi*-group)
nigrita J. Thomson, 1858; Gabon (AL)
Léveillé, A. 1910: 26. Reitter, E. 1876: 53 (*Peltis*)
obscura Léveille, 1899; Sumatra, Ternate (AL)
Léveillé, A. 1910: 26
orbicularis Léveille, 1894; Sumatra, Ternate (AL)
Léveillé, A. 1910: 26

ovalis M'Leay, 1825; Borneo, Java (AL)
Léveillé, A. 1910: 25. Reitter, E. 1876: 49 (comb.; transferred from *Peltis* to *Latolaeva*)
plana Léveille, 1902; E Africa (AL)
Léveillé, A. 1910: 26. Kolibáč, J. 2007b: 55 (shifted to *gabonica*-group)
pryeri Olliff, 1883; Borneo (AL)
Léveillé, A. 1910: 26
pygmea Léveille, 1907; Argentina (?)(AL)
Léveillé, A. 1910: 26
quadrimaculata Reitter, 1877; Malacca (AL)
Léveillé, A. 1910: 25
reitteri Olliff, 1883; New Guinea, Ins. Aru (AL)
Léveillé, A. 1910: 26
rufolineata Léveille, 1899; Cameroon (AL)
Léveillé, A. 1910: 26
shibatai Nakane, 1963; Japan (varA)
Nakane, T. 1963: 46. Kolibáč, J. 2007a: 365. Kolibáč, J. 2007b: 54 (shifted to *lewisi*-group). Nakane, T. et al. 1963: 182
simoni Reitter, 1880; Ashantee (AL)
Léveillé, A. 1910: 26
soror Léveille, 1902; Sumatra (AL)
Léveillé, A. 1910: 26
subrotundata Motschulsky, 1863; Sri Lanka (AL)
Léveillé, A. 1910: 26. Reitter, E. 1876: 53 (*Ostoma*)
vesca Olliff, 1885; Australia (AL)
Léveillé, A. 1910: 27
vicina Léveille, 1899; Cameroon (AL)
Léveillé, A. 1910: 27. Kolibáč, J. 2007b: 55 (shifted to *gabonica*-group)

Genus *Grynoma* Sharp, 1877

http://species-id.net/wiki/Grynoma
Fig. 10; Map 12

Sharp, D. 1877: 267

Type species. *Grynoma diluta* Sharp, 1877 [designated by Kolibáč 2005]
Léveillé, A. 1910: 29. Crowson, R. A. 1964a: 299 (as *Grynoma* Broun). Kolibáč, J. 2005: 59. Kolibáč, J. 2006: 111 (phylogeny).

Description. Body size: about 5.0–5.5 mm. Body shape flat. Gular sutures wide, convergent at apex. Frontoclypeal suture present. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum: ctenidium absent. Antennal groove absent. Eyes: size large, lateral. Eyes number: two. Epicranial acumination moderate. Lacinial hooks absent. Galea: shape sub-clavate. Galea: ciliate setae absent. Mediostipes-Lacinia partially fused. Palpifer: outer edge even. Mandibular apical teeth number:

two, horizontally situated. Mola absent. Penicillus (at base) long setae. Pubescence above mola or cutting edge absent. Ventral furrow absent. Basal notch shallow or absent. Labrum-Cranium fused. Epipharyngial sclerite absent. Lateral tormal process: projection projection not developed (all remaining). Ligula: ciliate setae absent. Ligula membranous, not retroflexed, weakly emarginate. Hypopharyngeal sclerite consisting of two separate parts. Antenna 10-segmented. Antennal club weakly asymmetrical, sensorial fields absent. Front coxal cavities externally open, internally open. Pronotum transverse. Prepectus present. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron moderate. Elytral interlocking mechanism absent, carinae reduced. Elytral punctation irregular, scales absent. Wing: radial cell moved down, often small, wedge cell absent, cross vein MP3-4 absent, cross vein AA1+2-3+4 absent. Front tibiae: spines along side moderate. Hooked spur absent, apical spurs not hooked or weakly hooked. Claws: denticle absent. Parasternites number along ventrites III–VII: one. Spiculum gastrale absent. Tegmen composed of three parts.

Larva: Paragular sclerites absent. Cardo-Stipes not fused. Cardo: size nearly as large as stipes. Torma H-shaped. Abdominal segment IX transversely divided. Tergite IX flat. Urogomphi present, hooked; median process present.

Biology. Crowson (1964a) found "*only detrital material and vegetable fibres*" in the gut of adult *G. varians*; however, there were "*insect fragments as well as detrital material*" in the gut of a larva of the same species. I assume that the adults and larvae are predatory.

Distribution. New Zealand.

Species:

albosparsa Broun, 1909; New Zealand (AL)
Léveillé, A. 1910: 29

ambiguum Broun, 1880; New Zealand (AL)
Léveillé, A. 1910: 21 (*Leperina ambigua*). Leschen, R. A. B. & Lackner, T. 2013: 301 (comb. from *Leperina*)

diluta Sharp, 1877; New Zealand (AL)
Léveillé, A. 1910: 29. Kolibáč, J. 2005: 59 (redescription)

fusca Sharp, 1877; New Zealand (AL)
Léveillé, A. 1910: 29

regularis Sharp, 1882; New Zealand (AL)
Léveillé, A. 1910: 29

varians Broun, 1893; New Zealand (RAC)
Crowson, R. A. 1964a: 297 (adult and larva). Kolibáč, J. 2006: 107 (larva)
Note: The species was omitted by Léveillé (1910)

Genus *Leptonyxa* Reitter, 1876

http://species-id.net/wiki/Leptonyxa
Fig. 11; Map 12

Reitter, E. 1876: 54.

Type species. *Leptonyxa brevicollis* Reitter, 1876 [designated by Kolibáč 2005]

Léveillé, A. 1910: 27. Kolibáč, J. 2005: 66. Kolibáč, J. 2006: 111 (phylogeny).

Remarks. I have studied only two species of *Leptonyxa*, *L. germaini* and *L. fairmairi*. The mandibles of the males are so peculiar that I hesitated over whether the genus truly belongs in Trogossitidae (Kolibáč 2006). Moreover, the other mouthparts – the reduced labrum, labium with divided prementum and plain galea and lacinia without sclerotized spurs or thorns – are also so highly modified that it is difficult to see trogossitid features in these body parts at all. More extensive material of *Leptonyxa* should be examined to establish a definitive morphological description of the genus.

Description. Body size: about 7.0 mm. Body shape flat. Gular sutures wide, convergent at apex. Frontoclypeal suture absent. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides present. Submentum: ctenidium absent. Antennal groove absent. Eyes: size large, lateral. Eyes number: two. Epicranial acumination absent. Lacinial hooks absent. Galea: shape elongate. Galea: ciliate setae absent. Mediostipes-Lacinia fused together. Palpifer: outer edge even. Mandibular apical teeth number: two, horizontally situated. Mola absent. Penicillus (at base) absent. Pubescence above mola or cutting edge present. Ventral furrow present. Basal notch shallow or absent. Labrum-Cranium fused. Epipharyngial sclerite absent. Lateral tormal process: projection projection not developed (all remaining). Ligula: ciliate setae absent. Ligula rigid, not retroflexed, weakly emarginate. Hypopharyngeal sclerite absent. Antenna 10-segmented. Antennal club weakly asymmetrical, sensorial fields absent. Front coxal cavities externally open, internally open. Pronotum transverse. Prepectus present. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron moderate. Elytral interlocking mechanism absent, carinae conspicuous. Elytral punctation regular, scales absent. Wing: radial cell moved down, often small, wedge cell absent, cross vein MP3-4 absent, cross vein AA1+2-3+4 absent. Front tibiae: spines along side moderate. Hooked spur present. Claws: denticle absent. Parasternites number along ventrites III–VII: absent. Spiculum gastrale absent. Tegmen composed of three parts. Coxitae undivided.

Biology. Nothing is known of the biology of these rare species. The last record known to me was made by a flight interception trap in Brazil. They are probably predatory.

Distribution. Tropical South America: Bolivia, Colombia, Brazil.

Species:

boliviensis Léveillé, 1895; Bolivia (AL)

Léveillé, A. 1910: 27

brevicollis Reitter, 1876; Colombia (AL)

Reitter, E. 1876: 54. Léveillé, A. 1910: 27. Kolibáč, J. 2005: 66 (redescription)

costipennis Reitter, 1876; Brazil (AL)

Reitter, E. 1876: 55. Léveillé, A. 1910: 27

fairmairei Léveillé, 1892; Brazil (AL)

Léveillé, A. 1910: 27. Kolibáč, J. 2006: 152

germaini Léveillé, 1895; Bolivia (AL)

Léveillé, A. 1910: 27

grouvellei Léveillé, 1895; Brazil (AL)
Léveillé, A. 1910: 27
ornata Léveillé, 1895; Brazil: Bahia (AL)
Léveillé, A. 1910: 27
sedilloti Léveillé, 1888; Colombia (AL)
Léveillé, A. 1910: 27
variegata Léveillé, 1907; Brazil (AL)
Léveillé, A. 1910: 27

Genus *Neaspis* Pascoe, 1872

http://species-id.net/wiki/Neaspis
Fig. 11; Map 12

Pascoe, F. P. 1872: 317.

Type species. *Neaspis villosa* Pascoe, 1872 [by monotypy]
Léveillé, A. 1910: 25. Matthews, E. G. 1992: 4. Kolibáč, J. 2005: 70. Kolibáč, J. 2006: 111 (phylogeny). Reitter, E. 1876: 47.

Description. Body size: about 4.0 mm. Body shape flat. Gular sutures wide, convergent at apex. Frontoclypeal suture absent. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum: ctenidium absent. Antennal groove absent. Eyes: size moderate. Eyes number: two. Epicranial acumination absent. Lacinial hooks absent. Galea: shape sub-clavate. Galea: ciliate setae absent. Mediostipes-Lacinia not fused. Palpifer: outer edge even. Mandibular apical teeth number: two, horizontally situated. Mola absent. Penicillus (at base) long setae. Pubescence above mola or cutting edge absent. Ventral furrow absent. Basal notch shallow or absent. Labrum-Cranium not fused. Epipharyngial sclerite absent. Lateral tormal process: projection projection not developed (all remaining). Ligula: ciliate setae absent. Ligula rigid, not retroflexed, weakly emarginate. Hypopharyngeal sclerite H-shaped. Antenna 10-segmented. Antennal club symmetrical, sensorial fields absent. Front coxal cavities externally open, internally open. Pronotum transverse. Middle coxal cavities closed. Elytra: long hairs absent. Epipleuron moderate. Elytral interlocking mechanism absent, carinae reduced. Elytral punctation regular, scales present. Wing: radial cell moved down, often small, wedge cell absent, cross vein MP3-4 absent, cross vein AA1+2-3+4 absent. Front tibiae: spines along side moderate. Hooked spur present. Claws: denticle absent. Spiculum gastrale absent. Tegmen composed of three parts. Coxitae undivided.

Biology. The species are probably predatory. According to Matthews (1992), they live in dry sclerophyll and Eremaean zones.

Distribution. The genus is autochthonous in Australia; *N. squamata* from the Phillippines is probably mislabelled, misidentified or introduced (I did not examine the species). Recently, I studied a specimen of *Neaspis* cf. *variegata* collected in Brazil

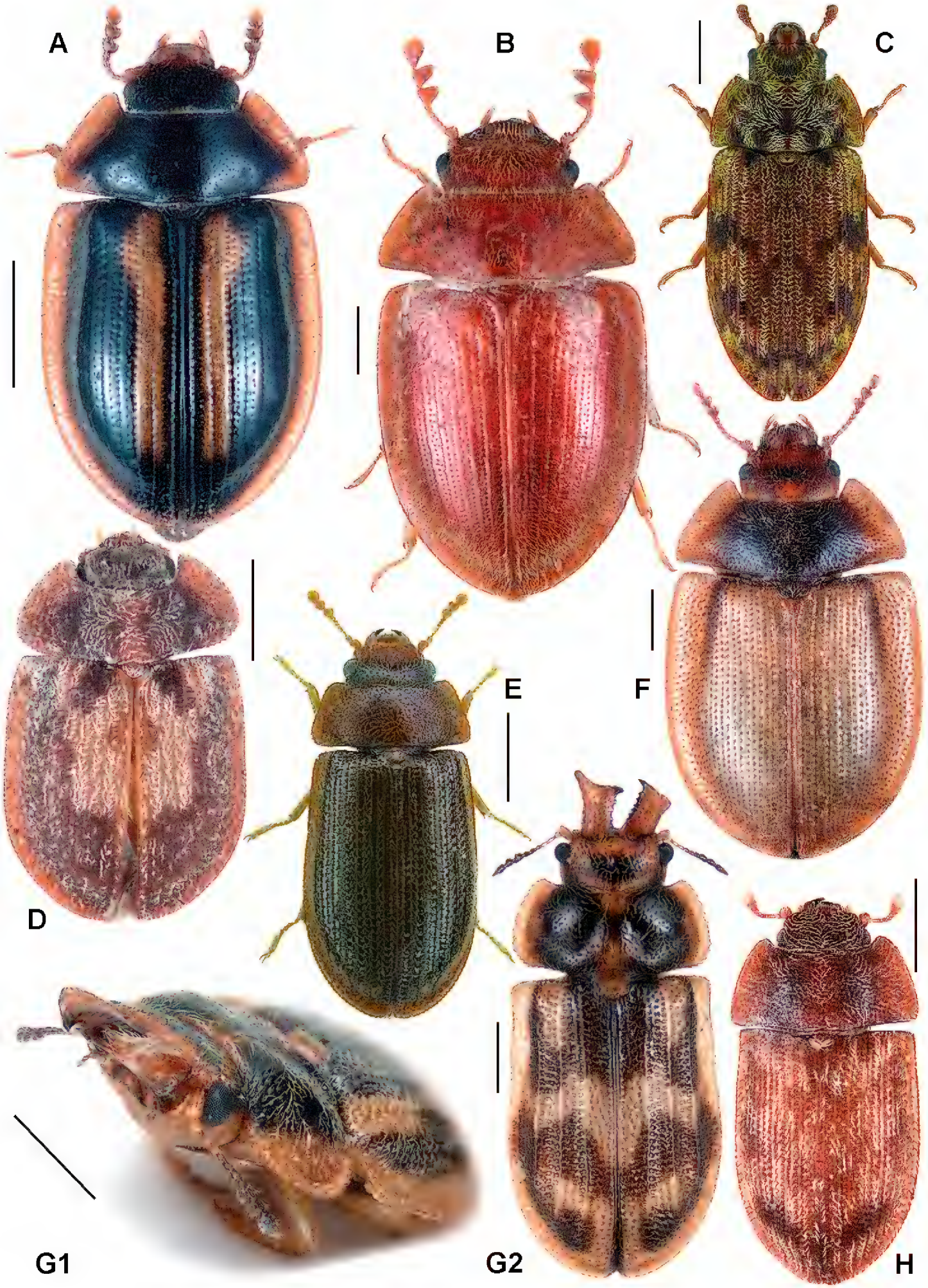


Figure 11. A *Ancyrona* (syn. *Latolaeva*) *bivittata* **B** *Ancyrona vicina* **C** *Ancyrona kosnovskorum* (= *fairmairi*?) **D** *Ancyrona* sp., *lewisi*-group, Malaysia **E** *Ancyrona japonica*, Slovakia **F** *Ancyrona gabonica* **G** *Leptonyxa fairmairi* **H** *Neaspis variegata*.

by Wygodzinski (coll. National Museum Prague), labelled as "Corcovado, Rio D.F." (= Rio de Janeiro, former Districto Federal). This record is believed to be plausible. The presence (either autochthonous distribution or introduction) might be the grounds for certain improbable descriptions of South American *Ancyrona* species.

Species:

pusilla Blackburn, 1891; South Australia (AL)
Léveillé, A. 1910: 25

sculpturata Reitter, 1876; Australia (AL)
Léveillé, A. 1910: 25. Reitter, E. 1876: 48

serrata Léveillé, 1907; Queensland (AL)
Léveillé, A. 1910: 25

squamata Escherich, 1822; Philippines: Luzon (AL)
Léveillé, A. 1910: 25. Reitter, E. 1876: 49
Note: doubtful record

variegata MacLeay, 1873; Australia, one specimen from Brazil (varA)
Léveillé, A. 1910: 25. Kolibáč, J. 2005: 70 (redescription). Reitter, E. 1876: 47 (*Neaspis subtrifasciata* Reitter, 1876)

villosa Pascoe, 1872; Australia (AL)
Léveillé, A. 1910: 25. Reitter, E. 1876: 48

† Genus *Sinosoronia* Zhang, 1992

http://species-id.net/wiki/Sinosoronia
Map 12

Zhang, J.-F. 1992: 333 [in Chinese], 336 [in English] (sub Nitidulidae)

Type species. *Sinosoronia longiantennata* Zhang, 1992 [by monotypy]

Kolibáč, J. 2006: 136 (Trogossitidae *incertae sedis*). Kolibáč, J. & Huang, D.-Y. 2008: 145 (Ancyronini). Ponomarenko, A. G. & Kireichuk, A. G. (2005–2008): http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm (Peltidae). Zhang, J.-F. 1992: 333 [in Chinese], 336 [in English]. Schmied, H. et al. 2009: 26.

Remarks. *Sinosoronia* might be related to another Mesozoic genus, *Peltocoleops*. The latter genus was described as "Cleroidea *incertae sedis*" (Ponomarenko 1990) and classified within Lophocaterini by myself (Kolibáč 2006). The two genera differ distinctly in the shape of the antennal club. This is compact and 3-segmented, with segments weakly asymmetrical in *Peltocoleops* but loose, 2- or 3-segmented, with segments distinctly asymmetrical in *Sinosoronia*. It is therefore suggested that the latter genus be classified within the tribe Ancyronini, which has corresponding features in recent representatives. The large, elevated eyes observed in *Sinosoronia* also support such a classification (according to Kolibáč and Huang 2008).

The "posterior femur" in the original description is probably the hind coxa. The long antenna with a loose club resembles that of species of the *Ancyrona gabonica*

species-group, while a similar shape of the pronotum may be found in the *colobicoides* species-group. Such an extremely small size of body is not known in recent Ancyronini but occurs in an concurrently described species from the late middle Eocene (Schmied et al. 2009). Apart from body size, the two species share large, elevated eyes and similar shape of pronotum. The time difference between these two very similar species is about 100 million years, much more than between the Eocene and the present time. Round body and body size might appear indicative of a group of the rentoniine genera. However, the body is much smaller (about 1 mm) and the antennae shorter with a symmetrical club in the rentoniins (Kolibáč 2005). If the asymmetrical club is considered an apomorphy, *Sinosoronia* may well be an ancestor of Ancyronini rather than Thymalini (according to Kolibáč and Huang 2008).

Original description. "*Brown in colour. Head about as long as wide. Mandibles large but dentes indistinguishable. Eyes circular, expanded laterally but exterior margin ill-preserved. Antennae 1.2 times as long as head and pronotum together, several basal segments ill-preserved except for the thickened scape, each flagellum cylindrical, about twice as long as wide, club elongate, nearly one-third the length of antenna, slightly thickened apically. Pronotum 2.1 times as broad as long; anterior margin arched, its median part straight, curved forwards laterally, lateral margins arched, posterior margin sinuate, and closely connected to elytra. Scutellum about as long as wide. Elytra smooth, not striated, exterior and interior margins slightly arched, shoulder rounded, its terminal part distinctly exceeding apex of abdomen, each elytron 2.6 times as long as wide. Middle and posterior femora seemingly clubbed, both tibiae and tarsi absent. Total length 2.3 mm, width 1.3 mm.*" (Zhang 1992: 336.)

Distribution. China: Shandong province; Mesozoic: Lower Cretaceous, Laiyang formation.

Species:

† *longiantennata* Zhang, 1992; China: Shandong; Lower Cretaceous: Laiyang formation (varA)

Kolibáč, J. 2006: 136. Kolibáč, J. & Huang, D.-Y. 2008: 145. Ponomarenko, A. G. & Kireichuk, A. G. (2005–2008): http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm. Schmied, H. et al. 2009: 26. Zhang, J.-F. 1992: 333 [in Chinese], 336 [in English]

Tribe Lophocaterini Crowson, 1964

Crowson, R. A. 1964a: 297 (Lophocaterinae).

Type genus: *Lophocateres* Olliff, 1883

Barron, J. R. 1971: 11, 12 (syn. Lophocateridae = Peltinae). Barron, J. R. 1975: 1119. Burakowski, B. et al. 1986: 119 (Lophocateridae). Kolibáč, J. 2006: 128 (diagnosis, stat. n.). Kolibáč, J. 2007a: 365. Kolibáč, J. 2010: 35. Lafer, G. Sh. 1992: 83

(key). Lawrence, J. F. & Newton, A. F., Jr. 1995: 868 (Lophocateridae). Lucht, W. 1998: 207 (key). Ślipiński, S. A. 1992: 442 (Lophocaterinae).

Lycoptini Casey, 1890 (Type genus: *Lycoptis* Casey, 1890)

Kolibáč, J. 2006: 128 (synonymized).

Remarks. The main issue to be addressed for Lophocaterini is their possible paraphyly in relation to Ancyronini. The whole clade (lophocaterins + ancyronins) is monophyletic but the lophocaterins might be paraphyletic (i.e., non-holophyletic in the traditional Hennigian meaning) because ancyronins can only be advanced members of more primitive lophocaterins. See also "Remarks" in the Ancyronini section. Further, more detailed study is required to resolve the question. The generic composition of Decamerini and its position within Lophocaterinae should be examined along – not, however, before an associated larva of the decamerins is known.

A key to genera (after Kolibáč 2010)

1 Elytra with irregular punctation; lateral margins of pronotum broadly explanate, lateral edge sparsely denticulate..... ***Eronyxa***

– Elytra regularly punctate; lateral margins of pronotum narrowly explanate, lateral edge almost entirely evenly rounded or densely denticulate **2**

2 Antenna 7- or 9-segmented..... **3**

– Antenna 11-segmented **5**

3 Antenna 7-segmented, club 1-segmented; mandible with mola..... ***Lycoptis***

– Antenna 9-segmented, club 2- or 3-segmented; mandible without mola..... **4**

4 Antennal club 2-segmented; mandible with prostheca near base of mandible formed by tuft of long setae; submental area lacking concave or depressed area; wing with oblong radial cell..... ***Grynocharina***

– Antennal club 3-segmented; mandible without penicillus or prostheca; submental area concave; wing with small triangular radial cell displaced downwards ..... ***Peltonyxa***

5 Lateral edge of pronotum densely denticulate; lacinia with one pigmented spine ..... ***Indopeltis***

– Lateral edge of pronotum evenly rounded or at most finely undulating; lacinia with two or three pigmented spines..... **6**

6 Elytra with inconspicuous carinae; mola absent; ligula deeply emarginate; probably predatory. Larva: sensory appendix very short ..... ***Promanus***

– Elytra with conspicuous carinae; mola or remnant of mola present; ligula deeply or weakly emarginate. Mode of life: predatory (*Trichocateres*), herbivorous (*Lophocateres*), fungivorous (*Grynocharis*). Larva (*Lophocateres*, *Grynocharis*): length of sensory appendix about half or more than half that of antennal segment 3..... **7**

7 Elytra with six carinae; tegmen without projecting phallobasic apodeme; lacinia with three pigmented, hooked spines; small species (less than 3 mm)..... ..... ***Lophocateres***

– Elytra with five or four distinct carinae; tegmen with projecting phallobasic apodeme; different pattern of pigmented lacinial spines; larger species (above 5 mm) **8**

8 Elytra with four distinct (higher) carinae and another three to four lower carinae among them; pronotum and elytra without tufts of long hairs, with short decumbent or semi-erect pubescence only, or without conspicuous pubescence; lacinia with two pigmented, hooked spines; tibial apical spur pattern 2-2-2; larger species (about 4.5–10.5 mm)..... ***Grynocharis***

– Elytra with only five distinct carinae; pronotum and elytra with tufts of long, yellow-orange hairs; lacinia with three pigmented spines at apex in pattern 1+2, apical spine large and hooked, two other spines much smaller; tibial apical spur pattern 1-1-1; smaller species (about 5 mm) ..... ***Trichocateres***

Genus *Eronyxa* Reitter, 1876

http://species-id.net/wiki/Eronyxa

Fig. 10; Map 11, 13

Reitter, E. 1876: 57.

Type species. *Ostomodes dohrni* Reitter, 1876 [by monotypy]

Barron, J. R. 1971: 38. Reitter, E. 1876: 57. Kolibáč, J. 2005: 55 (redescription). Kolibáč, J. 2006: 111 (phylogeny). Kolibáč, J. 2010: 35 (key). Léveillé, A. 1910: 28.

Ostomodes Reitter, 1877 (Type species: *Ostomodes dohrni* Reitter, 1876)

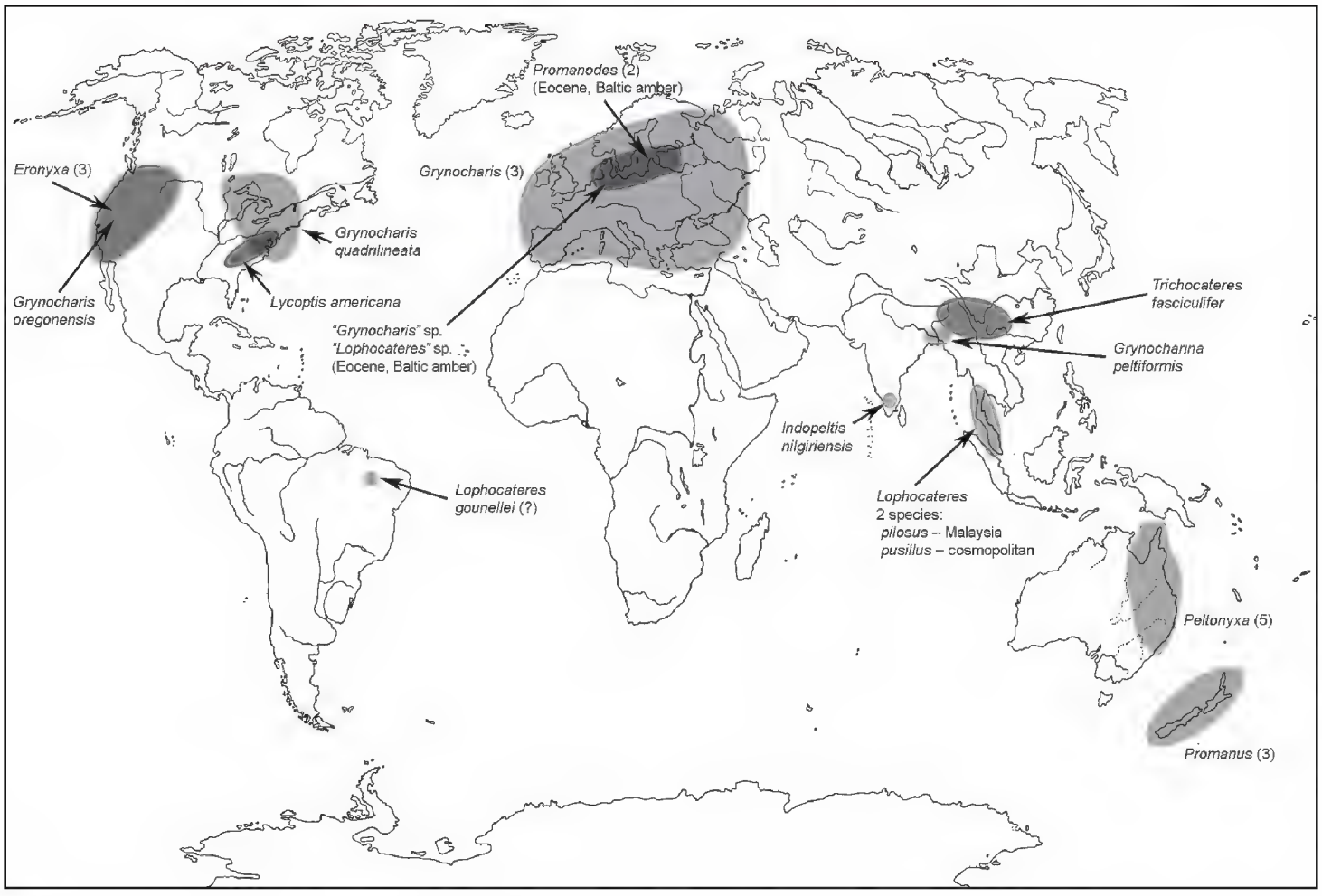
Barron, J. R. 1971: 38. Léveillé, A. 1910: 28. Schaeffer, C. F. A. 1915: 69. Schaeffer, C. F. A. 1918: 200. Casey, 1916: 284. Crowson, R. A. 1964a: 290. Crowson, R. A. 1966: 125.

Grynocharis (pars.)

Barron, J. R. 1971: 38. Van Dyke, E. C. 1916: 73.

Remarks. The genus was formerly classified within Decamerini (Crowson 1964a and others). John Doyen (in Tait et al. 1990) described a larva of *Eronyxa expansus* and, considering its distinct similarity to known lophocaterine larvae, shifted *Eronyxa* to Lophocaterini. Although this classification was confirmed by myself (Kolibáč 2006, 2008), both character analyses showed *Eronyxa* in a basal position of the lophocaterine clade (= Lophocaterini + Ancyronini) along a border near the Decamerini-Lophocaterini split. However, the adult characters indicate a sister relationship with Decamerini [(*Eronyxa* (*Diontolobus* + *Decamerus*)) (Lophocaterini)] rather than Lophocaterini [(*Diontolobus* + *Decamerus*)(*Eronyxa* + Lophocaterini)]. See also "Remarks" in the Decamerini section.

Description. Body size: about 3.5 mm. Body shape flat. Gular sutures wide, convergent at apex. Frontoclypeal suture present. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum: ctenidium absent. Antennal groove absent. Eyes: size large, lateral. Eyes number: two. Epicranial acumination moderate. Lacinial hooks: two. Galea: shape very small.



Map 13. A distribution of the tribe Lophocaterini.

Galea: ciliate setae absent. Mediostipes-Lacinia not fused. Palpifer: outer edge even. Mandibular apical teeth number: two, horizontally situated. Mola present. Penicillus (at base) present (fine, often membranous). Pubescence above mola or cutting edge absent. Ventral furrow absent. Basal notch moderate. Labrum-Cranium not fused. Epipharyngial sclerite absent. Lateral tormal process: projection projections extending laterally and downwards (Eronyxa). Ligula: ciliate setae absent. Ligula membranous, not retroflexed, deeply emarginate. Hypopharyngeal sclerite absent. Antenna 11-segmented. Antennal club symmetrical, sensorial fields absent. Front coxal cavities externally open, internally open. Pronotum transverse. Prepectus present. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron thin. Elytral interlocking mechanism absent, carinae reduced. Elytral punctation irregular, scales absent. Wing: radial cell moved down, often small, wedge cell absent, cross vein MP3-4 present, cross vein AA1+2-3+4 absent. Front tibiae: spines along side large. Hooked spur absent, apical spurs not hooked or weakly hooked. Claws: denticle absent. Parasternites number along ventrites III–VII: two. Spiculum gastrale absent. Tegmen composed of two parts. Coxitae divided.

Larva: Frontal arms V-shaped. Epicranial stem absent. Endocarina present. Gular sutures conspicuous, convergent. Paragular sclerites absent. Hypostomal rods absent. Stemmata number: two. Mandibular apical teeth number: two, horizontally even, vertically situated. Lacinia mandibulae plumose. Mola absent. Maxillary palpi 3-segmented. Palpifer present. Pedunculate seta absent. Mala simple. Mala: bidentate protrusion

absent. Cardo-Stipes partially fused. Ligula present. Labial palpi 2-segmented. Prementum in two parts. Torma H-shaped. Antennal joints 1 and 2 elongate. Sensory appendix very small. Thoracic sclerites pattern (dorsally) 1-0-0. Thoracic sclerites pattern (ventrally) 1+0+0. Trochanter triangular. Abdominal segment IX transversely divided. Tergite IX flat. Urogomphi present, hooked; median process present.

Biology. *Eronyxa expansus* was collected under the bark of *Libocedrus* (= *Calocedrus*) *decurrens*. The larva probably feeds on *Xylococculus macrocarpae* (Barron 1971, Tait et al. 1990). *Eronyxa pallidus* has been found on flowers, for example *Aruncus sylvester* and *Ceanothus cuneatus*, and an imago was reared from a stem of the latter plant. The third species, *E. angustus*, was also found on *Fraxinus* blossoms and on *Pinus ponderosa* (Barron 1971).

Distribution. Western states of USA (California, Idaho, Nevada, Oregon) and Canada (British Columbia).

Species:

angustus Casey, 1916; USA: California, Idaho, Nevada, Oregon (JRB)

Barron, J. R. 1971: 42. Kolibáč, J. 2005: 55 (redescription)

expansus Van Dyke, 1916; USA: California (JRB)

Barron, J. R. 1971: 38. Kolibáč, J. 2006: 107 (larva). Leschen, R. A. B. 2000: 920 (biology). Tait, S. M. et al. 1990: 13 (larva)

pallida Motschulsky, 1863; Canada: British Columbia, USA: California, Oregon (JRB)

Léveillé, A. 1910: 28. Barron, J. R. 1971: 39 (syn. *Grynocharis pilosula* Crotch, 1873; synonymized by whom?). Barron, J. R. 1971: 39 (syn. *Ostomodes dohrni* Reitter, 1877; synonymized by Léveillé 1910?). Barron, J. R. 1971: 39 (syn. *Ostomodes lagrioides* Reitter, 1876; synonymized by whom?). Crowson, R. A. 1964a: 291 (*Ostomodes*). Kolibáč, J. 2005: 55 (redescription). Reitter, E. 1876: 58 (*Eronyxa lagrioides*)

Genus *Grynocharina* Reitter, 1877

http://species-id.net/wiki/Grynocharina

Fig. 12; Map 13

Reitter, E. 1877: 132.

Type species. *Grynocharina peltiformis* Reitter, 1877 [by monotypy].

Léveillé, A. 1910: 24. Kolibáč, J. 2005: 57 (redescription). Kolibáč, J. 2006: 111 (phylogeny). Kolibáč, J. 2010: 35 (key).

Remarks. Only a single male specimen of the monotypic genus is known. *Grynocharina peltiformis* was originally placed in a basal position on the lophocaterine tree (Kolibáč 2006: 131) and classified within Lophocaterini. However, that tree was constructed after character weighting. A tree under equal weights contains *G. peltiformis* among the ancyronins in both analyses (Kolibáč 2006, 2008). I maintain the position of the species

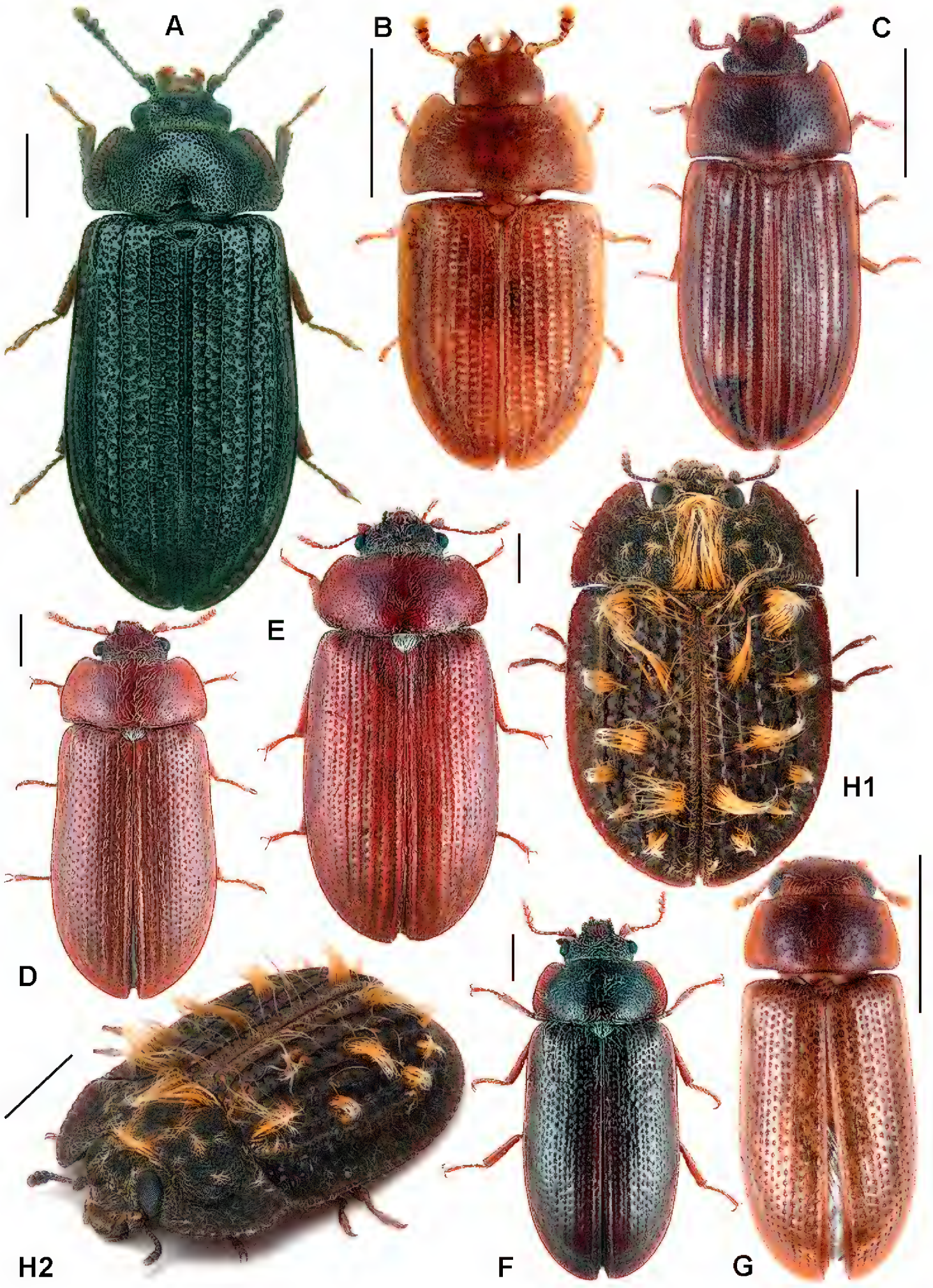


Figure 12. A *Grynocharis oblonga* **B** *Grynocharina peltiformis* **C** *Lophocateres pusillus* **D** *Promanus auripilis* **E** *Promanus subcostatus* **F** *Promanus depressus* **G** *Peltonyxa* sp., Australia, NSW **H** *Trichocateres fasciculifer*.

in Lophocaterini, following the original classification of 2006 and especially the key of 2010 (*l.c.*) Regarding the probable paraphyletic status of Lophocaterini, the question of ancyronine/lophocaterine placement of *G. peltiformis* is rendered highly irrelevant.

Description. Body size: 3.0 mm. Body shape flat. Gular sutures wide, convergent at apex. Frontoclypeal suture present. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum: ctenidium absent. Antennal groove present. Eyes: size large, lateral. Eyes number: two. Epicranial acumination moderate. Lacinial hooks: three. Galea: shape sub-clavate. Galea: ciliate setae absent. Mediostipes-Lacinia not fused. Palpifer: outer edge even. Mandibular apical teeth number: two, horizontally situated. Mola absent. Penicillus (at base) long setae. Pubescence above mola or cutting edge absent. Ventral furrow present, not ciliate. Basal notch shallow or absent. Labrum-Cranium not fused. Epipharyngial sclerite absent. Lateral tormal process: projection projection curved upwards (*Colydiopeltis*). Ligula: ciliate setae absent. Ligula membranous, not retroflexed, weakly emarginate. Hypopharyngeal sclerite H-shaped. Antenna 9-segmented. Antennal club weakly asymmetrical, sensorial fields absent. Front coxal cavities externally open, internally open. Pronotum transverse. Prepectus present. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron thin. Elytral interlocking mechanism absent, carinae conspicuous. Elytral punctation regular, scales absent. Wing: radial cell oblong (or reduced), wedge cell absent, cross vein MP3-4 absent, cross vein AA1+2-3+4 absent. Front tibiae: spines along side moderate. Hooked spur present. Claws: denticle absent. Parasternites number along ventrites III–VII: two. Spiculum gastrale present. Tegmen composed of three parts.

Biology. Unknown.

Distribution. Burma (Myanmar).

Species:

peltiformis Reitter, 1877; Burma (AL)

Léveillé, A. 1910: 24. Kolibáč, J. 2005: 57 (redescription)

Genus *Grynocharis* Thomson, 1862

http://species-id.net/wiki/Grynocharis

Figs 12, 18; Map 13

Thomson, C. G. 1862: 71.

Type species. *Silpha oblonga* Linnaeus, 1758 [by original designation and monotypy].

Léveillé, A. 1910: 31. Barron, J. R. 1971: 32. Kolibáč, J. 2005: 58 (redescription). Kolibáč, J. 2006: 111 (phylogeny). Kolibáč, J. 2007a: 365. Kolibáč, J. 2010: 35 (key). Lafer, G. Sh. 1992: 84. Larsson, S. G. 1978: 150 (Baltic amber fossil). Spahr, U. 1981: 74 (amber and copal fossils).

Gaurambe Thomson, 1859

Barron, J. R. 1971: 32 (syn. *Gaurambe* Thomson, 1859; misapplied)

Description. Body size: about 5.5–8.0 mm. Body shape flat. Gular sutures wide, convergent at apex. Frontoclypeal suture broadly emarginate. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum: ctenidium absent. Antennal groove present. Eyes: size moderate. Eyes number: two. Epicranial acumination deep. Lacinial hooks: two. Galea: shape subclavate. Galea: ciliate setae absent. Mediostipes-Lacinia not fused. Palpifer: outer edge even. Mandibular apical teeth number: two, horizontally situated. Mola reduced but present. Penicillus (at base) present (fine, often membranous). Pubescence above mola or cutting edge absent. Ventral furrow present, not ciliate. Basal notch shallow or absent. Labrum-Cranium not fused. Epipharyngial sclerite absent. Lateral tormal process: projection curved downwards, processes with bridge (*Peltis*). Ligula: ciliate setae absent. Ligula membranous, not retroflexed, weakly emarginate. Hypopharyngeal sclerite consisting of two separate parts. Antenna 11-segmented. Antennal club weakly asymmetrical, sensorial fields absent. Front coxal cavities externally open, internally open. Pronotum transverse. Prepectus present. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron moderate. Elytral interlocking mechanism absent, carinae conspicuous. Elytral punctation regular, scales absent. Wing: radial cell moved down, often small, wedge cell absent, cross vein MP3-4 absent, cross vein AA1+2-3+4 absent. Front tibiae: spines along side moderate. Hooked spur present. Claws: denticle absent. Parasternites number along ventrites III–VII: two. Spiculum gastrale present. Tegmen composed of three parts.

Larva: Frontal arms V-shaped. Epicranial stem absent. Endocarina present. Stemmata number: two. Mandibular apical teeth number: two, horizontally situated. Lacinia mandibulae plumose. Mola absent. Maxillary palpi 3-segmented. Pedunculate seta absent. Mala simple. Mala: bidentate protrusion absent. Cardo-Stipes not fused. Cardo: size nearly as large as stipes. Ligula present. Labial palpi 2-segmented. Prementum in single part. Antennal joints 1 and 2 elongate. Sensory appendix medium sized (to half of joint 3). Thoracic sclerites pattern (dorsally) 1-2-2. Abdominal segment IX transversely divided. Tergite IX flat. Urogomphi present, hooked; median process present.

Biology. Adults and larvae of *G. oblonga* live under bark or bark scales and in rotten wood of deciduous and coniferous trees (willow, birch, spruce, fir); they are fungivorous. In the USA, the species have been collected on *Libocedrus decurrens* and *Populus* (Barron 1971).

Distribution. Europe including Russia to the Urals, Caucasus; USA excluding central and southern states, Canada: south-western and south-eastern states.

Species:

caucasica Motschulsky, 1863; Caucasus (JK)

Léveillé, A. 1910: 31 (*Ostoma*). Kolibáč, J. 2007a: 366 (nomen dubium)

oblonga Linnaeus, 1758; all Europe to Russia (varA)

Léveillé, A. 1910: 31 (*Ostoma* (subgen. *Grynocharis*)). Bahillo de la Puebla, P. & López-Colón, J. I. 2004: 129. Borowiec, L. 1983: 13. Burakowski, B. et al. 1986: 119. Conrad, R. 1995: 190. Gobbi, G. 1996: 65. Klausnitzer, B. 1976: 8. Klausnitzer, B. 1978: 178. Klausnitzer, B. 1996: 163. Kolibáč, J. 1993a: 21. Kolibáč, J.

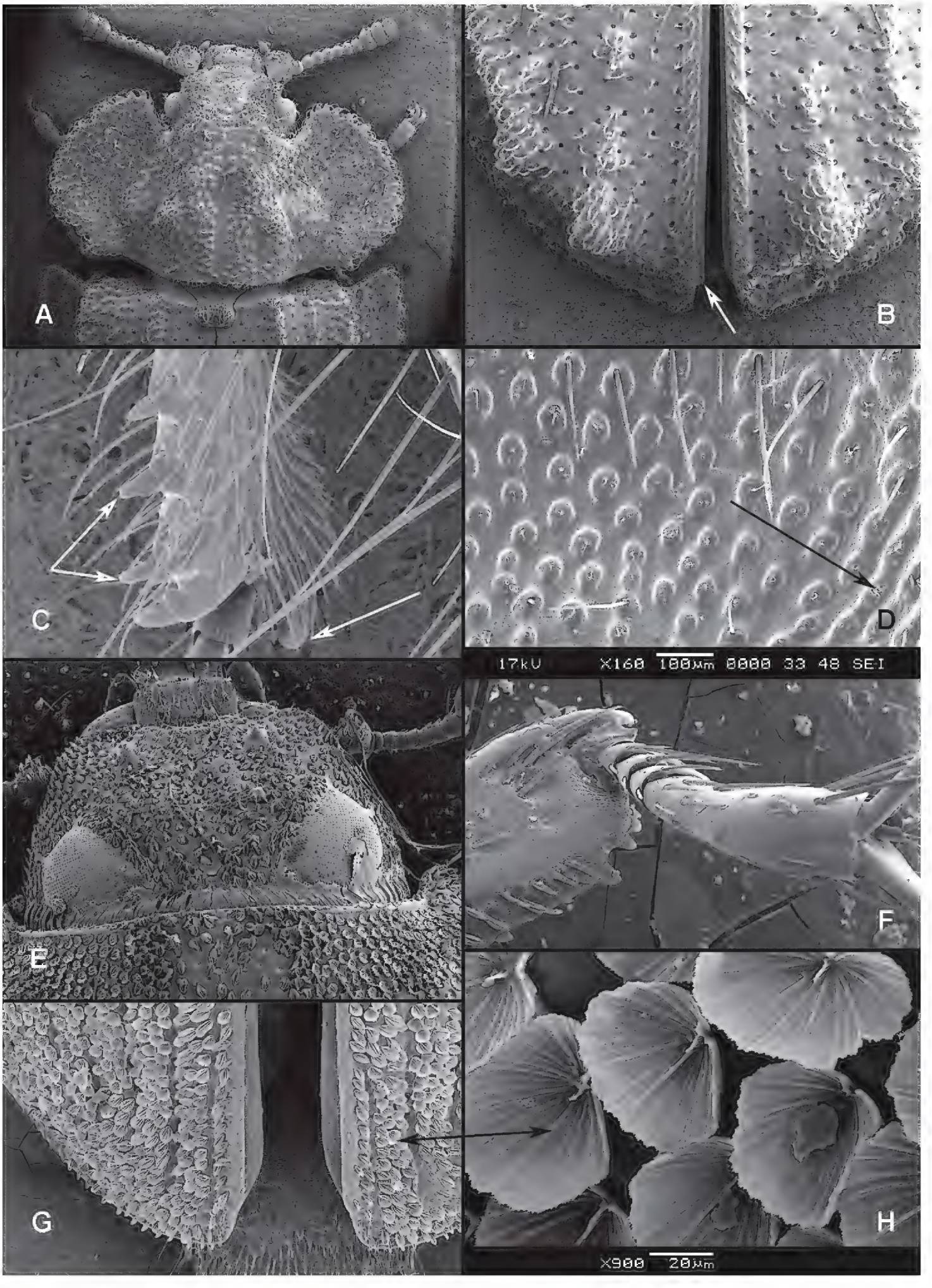


Figure 13. A–B *Calitys scabra* (**A** head and pronotum **B** elytral apex with interlocking mechanism) **C–D** *Acalanthis quadrisignata* (**C** apex of protibia with hooked spur and lateral spines **D** sculpture of frons with punctures conjoined into wrinkles) **E–H** *Gymnocheilis* sp., Cameroon (**E** head **F** protibia **G** elytral apex **H** detail of scales).

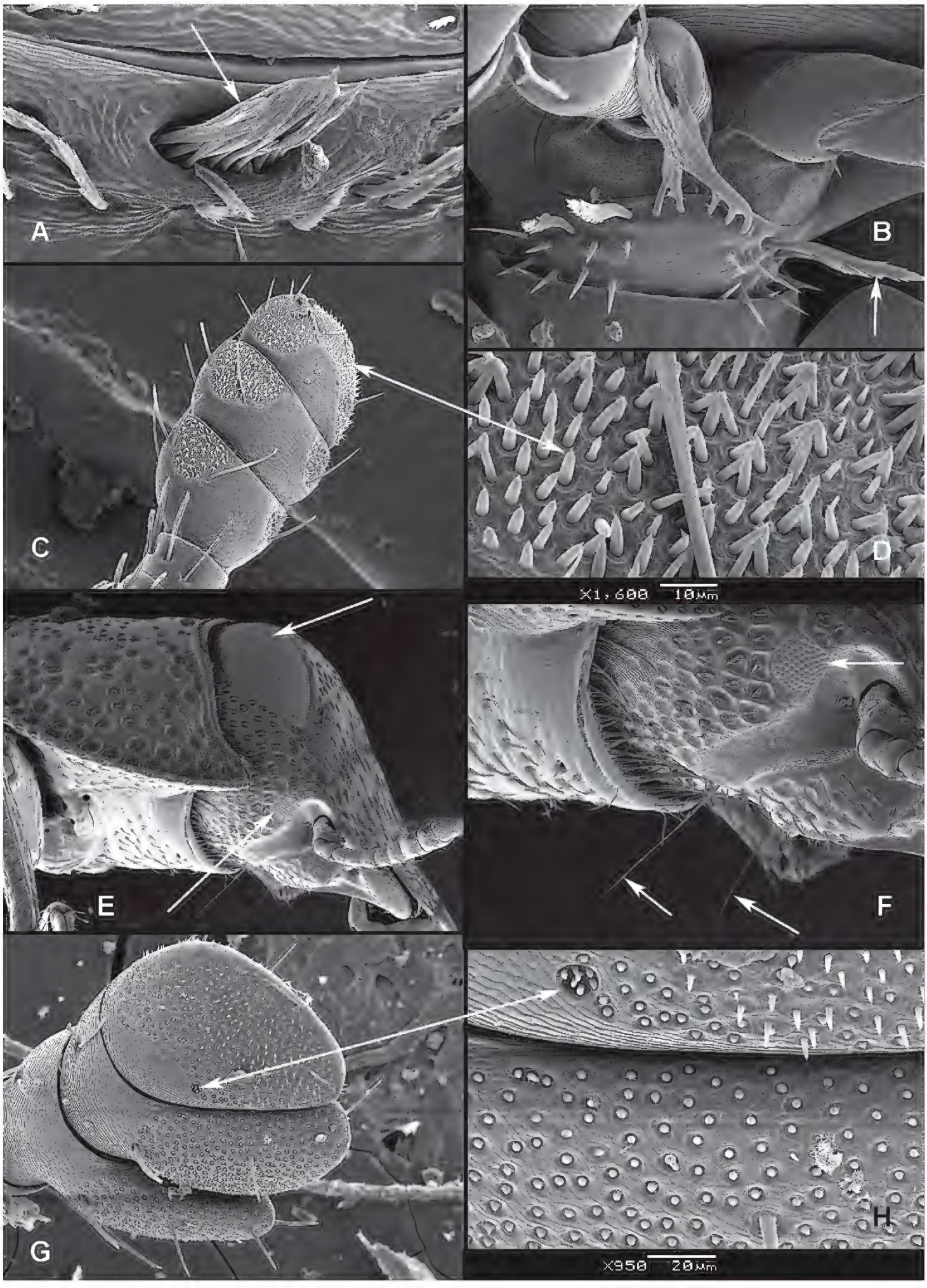


Figure 14. A–F *Anacypta* sp., Assam (**A** ctenidium **B** labium with ciliate setae **C** antennal club with sensorial fields **D** detail of sensillae **E** head laterally with divided eye **F** detail of sensorial setae and ventral eye) **G–H** *Gymnocheilis* sp., Cameroon (**G** antennal club **H** detail of sensillae).

1993b: 90. Kolibáč, J. 2005: 58 (redescription). Kolibáč, J. 2006: 107 (larva, phylogeny). Kolibáč, J. 2007a: 365 (distribution). Lafer, G. Sh. 1992: 84. Lemdahl, G. 2001: 39 (biology). Mitter, H. 1998: 561. Nilsson, S. G. 1997: 1 (biology). Pileckis, S. & Monsevičius, V. 1995: 272. Reitter, E. 1876: 63 (*Ostoma*). Vogt, H. 1967: 18

oregonensis Schaeffer, 1918; USA, Canada: western states (JRB)

Léveillé, A. 1910: 31 (*Ostoma* (subgen. *Grynocharis*) *oregonensis* Crotch, 1873). Barron, J. R. 1971: 34. Dajoz, R. 1997: 44 (biology)

pubescens Erichson, 1844; Georgia, South European Territory of Russia, „Caucasus", Crimea (JK)

Léveillé, A. 1910: 31 (*Ostoma* (subgen. *Grynocharis*)). Lafer, G. Sh. 1992: 84. Kolibáč, J. 2006: 107. Kolibáč, J. 2007a: 365. Mamaev, B. M. 1976: 1656 (larva). Reitter, E. 1876: 63 (*Ostoma*)

quadrilineata Melsheimer, 1844; NE USA, Canada: Ontario, Quebec (JRB)

Léveillé, A. 1910: 31 (*Ostoma* (subgen. *Grynocharis*) *marginata* Melsheimer, 1844). Barron, J. R. 1971: 33 (syn. *Grynocharis marginata* Melsheimer, 1844, synonymized by Lacordaire 1854?). Reitter, E. 1876: 63 (*Ostoma*)

Genus *Indopeltis* Crowson, 1966

http://species-id.net/wiki/Indopeltis

Map 13

Crowson, R. A. 1966: 126.

Type species: *Indopeltis nilgiriensis* Crowson, 1966 [by original designation and monotypy]

Kolibáč, J. 2005: 61 (redescription). Kolibáč, J. 2006: 111 (phylogeny). Kolibáč, J. 2010: 35 (key).

Description. Body size: about 5.5 mm. Body shape flat. Gular sutures wide, convergent at apex. Frontoclypeal suture absent. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum: ctenidium absent. Eyes: size large, lateral. Eyes number: two. Epicranial acumination moderate. Lacinial hooks: one. Galea: shape elongate. Galea: ciliate setae absent. Mediostipes-Lacinia not fused. Palpifer: outer edge even. Mandibular apical teeth number: two, horizontally situated. Mola present. Penicillus (at base) absent. Pubescence above mola or cutting edge present. Ventral furrow present. Basal notch moderate. Labrum-Cranium not fused. Epipharyngial sclerite absent. Lateral tormal process: projection projection not developed (all remaining). Ligula: ciliate setae absent. Ligula membranous, not retroflexed, deeply emarginate. Hypopharyngeal sclerite H-shaped. Antenna 11-segmented. Antennal club weakly asymmetrical, sensorial fields absent. Front coxal cavities externally open, internally open. Pronotum transverse. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron moderate. Elytral interlocking mechanism absent, carinae conspicuous. Elytral punctation regular, scales absent.

Wing: radial cell moved down, often small, wedge cell absent, cross vein MP3-4 absent, cross vein AA1+2-3+4 absent. Front tibiae: spines along side moderate. Hooked spur present. Claws: denticle absent. Spiculum gastrale present. Tegmen composed of three parts.

Biology. Unknown; Crowson (1966) speculated that the species was "*subcortical as in most Peltinae*".

Distribution. India: Tamil Nadu, Nilgiri Hills.

Species:

nilgiriensis Crowson, 1966; South India: Tamil Nadu (RAC)

Crowson, R. A. 1966: 126. Kolibáč, J. 2005: 61 (redescription). Kolibáč, J. 2006: 111 (phylogeny)

Genus *Lophocateres* Olliff, 1883

http://species-id.net/wiki/Lophocateres

Figs 2, 12, 18; Map 13

Olliff, A. S. 1883c: 180.

Type species. *Lophocateres nanus* Olliff, 1883 [by monotypy] (= *Lophocateres pusillus* Klug, 1833)

Léveillé, A. 1910: 27. Barron, J. R. 1971: 42. Crowson, R. A. 1964a: 299. Kolibáč, J. 2005: 67 (redescription). Kolibáč, J. 2006: 111 (phylogeny). Kolibáč, J. 2007a: 366. Kolibáč, J. 2010: 35 (key). Lafer, G. Sh. 1992: 84. Larsson, S. G. 1978: 150 (fossil, Baltic amber). Spahr, U. 1981: 74 (amber and copal fossils).

Description. Body size: about 2.5–4.0 mm. Body shape flat. Gular sutures wide, convergent at apex. Frontoclypeal suture broadly emarginate. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum: ctenidium absent. Antennal groove present. Eyes: size large, lateral. Eyes number: two. Epicranial acumination moderate. Lacinial hooks: three. Galea: shape sub-clavate. Galea: ciliate setae absent. Mediostipes-Lacinia not fused. Palpifer: outer edge even. Mandibular apical teeth number: two, horizontally situated. Mola present. Penicillus (at base) present (fine, often membranous). Pubescence above mola or cutting edge present. Ventral furrow absent. Basal notch moderate. Labrum-Cranium not fused. Epipharyngial sclerite absent. Lateral tormal process: projection projection curved upwards (*Colydiopeltis*). Ligula: ciliate setae absent. Ligula membranous, not retroflexed, weakly emarginate. Hypopharyngeal sclerite consisting of two separate parts. Antenna 11-segmented. Antennal club weakly asymmetrical, sensorial fields absent. Front coxal cavities externally open, internally open. Pronotum transverse. Prepectus present. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron moderate. Elytral interlocking mechanism absent, carinae conspicuous. Elytral punctation regular, scales absent. Wing: radial cell moved down, often small, wedge cell absent, cross vein MP3-4 absent, cross vein AA1+2-3+4 absent. Front tibiae: spines

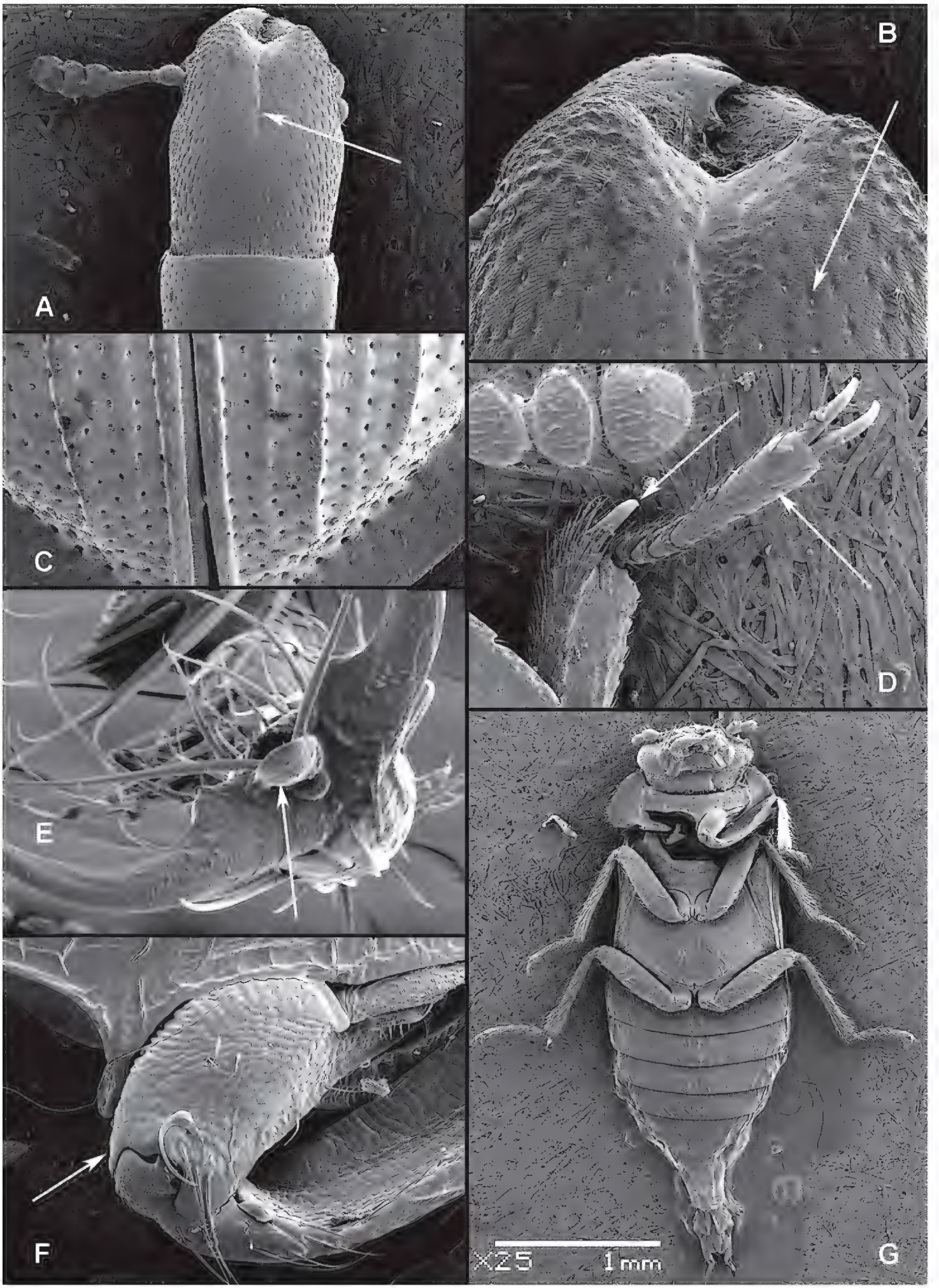


Figure 15. A–B *Nemozoma elongatum* (**A** cranium with longidutinal groove **B** detail of elongate punctures) **C–D** *Peltis ferruginea* (**C** elytral apex **D** antennal club, hooked spur and protarsus with large 5th tarsomere) **E–G** *Phloiophilus edwardsi* (**E** metatarsal claws and empodium **F** projecting procoxae **G** ventral surface).

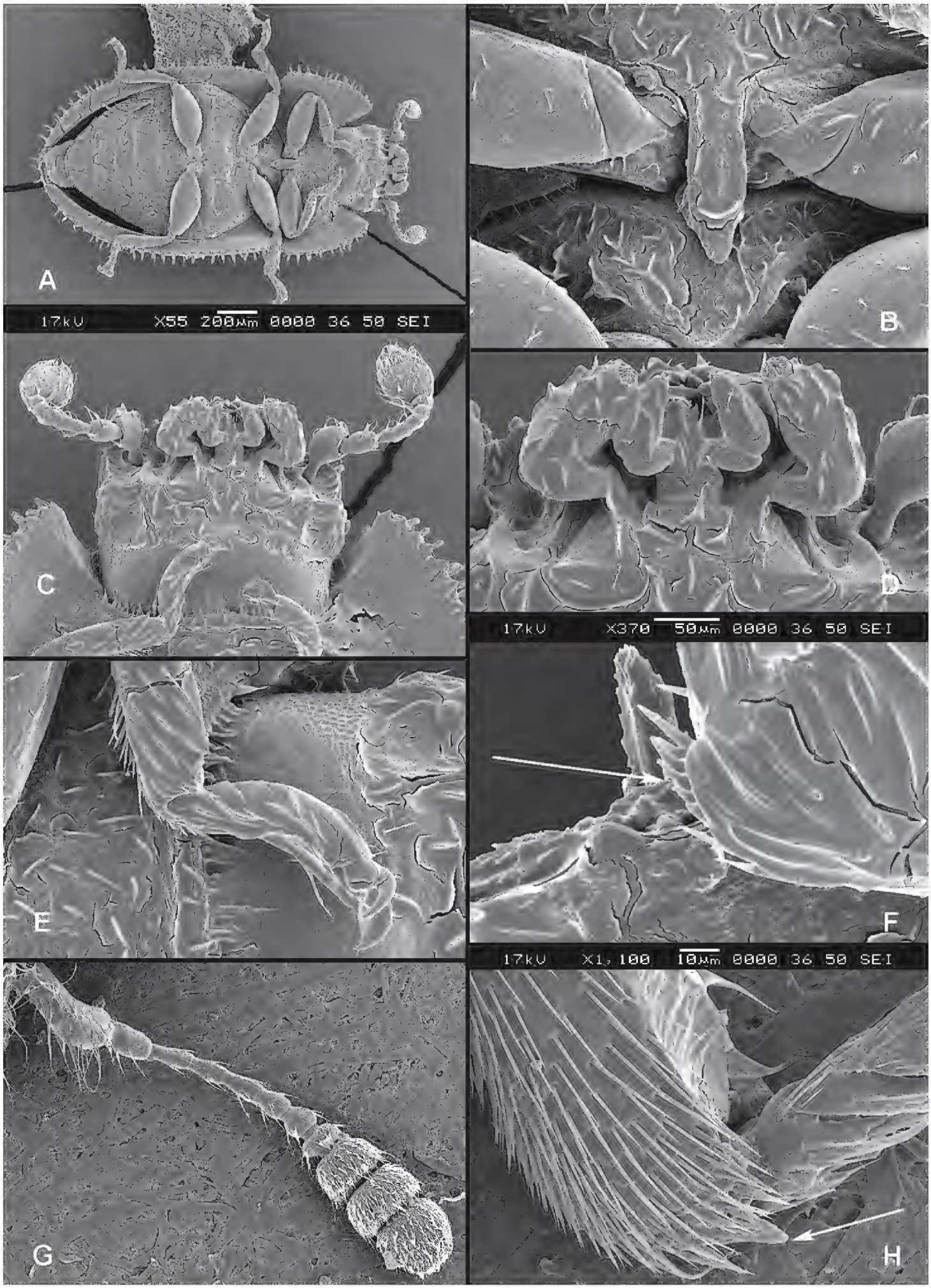


Figure 16. A–F *Colydiopeltis compactum* (**A** ventral surface **B** procoxal area **C** head ventrally **D** detail of mouthparts **E** protarsus **F** apex of metatibia with row of spines) **G–H** *Thymalus limbatus* (**G** antenna **H** apex of protibia with straight spur).

along side moderate. Hooked spur present. Claws: denticle absent. Parasternites number along ventrites III–VII: one. Spiculum gastrale absent. Tegmen composed of three parts. Coxitae undivided.

Larva: Frontal arms V-shaped. Epicranial stem absent. Endocarina present. Gular sutures conspicuous, convergent. Gula: anterior apodemes absent. Paragular sclerites absent. Hypostomal rods absent. Stemmata number: two. Mandibular apical teeth number: two, horizontally situated. Lacinia mandibulae plumose. Mola absent. Maxillary palpi 3-segmented. Palpifer present. Pedunculate seta absent. Mala simple. Mala: bidentate protrusion absent. Cardo-Stipes not fused. Cardo: size nearly as large as stipes. Ligula present. Labial palpi 2-segmented. Prementum in single part, anterior margin even. Torma H-shaped. Antennal joints 1, 2 transverse. Sensory appendix larger than half of joint 3. Thoracic sclerites pattern (dorsally) 0+0+0. Thoracic sclerites pattern (ventrally) 2+0+0. Trochanter triangular. Abdominal segment IX transversely divided. Tergite IX flat. Urogomphi present, hooked; median process present.

Biology. *Lophocateres pusillus* lives in storage facilities (warehouses, stores, barns, larders) and feeds on grains. The biology of wild populations is unknown.

Distribution. *Lophocateres pusillus* is cosmopolitan, although the centre of its distribution, is in south-eastern Asia. The species *L. gounellei* is probably a misidentification or a synonym of *L. pusillus.* Some new species are known to me from Malaysia.

Species:

gounellei Léveillé, 1905; Brazil (AL)

Léveillé, A. 1910: 27

Note: dubious species – probably synonym of *L. pusillus* or different genus

pilosus Olliff, 1883; Malaysia: Penang (AL)

Léveillé, A. 1910: 27

pusillus Klug, 1833; cosmopolitan (origin in SE Asia) (varA)

Léveillé, A. 1910: 27 (syn. *Lophocateres africanus* Motschulsky, 1863); Algeria (AL)

Léveillé, A. 1910: 27 (as *Lophocateres nanus* Olliff, 1883); Borneo (AL)

Léveillé, A. 1910: 27 (syn. *Lophocateres yvani* Allibert, 1847). Bahillo de la Puebla, P. & López-Colón, J. I. 2004: 129. Barron, J. R. 1971: 43 (syn. *Lophocateres nanus* Olliff, 1883). Barron, J. R. 1971: 43 (syn. *Peltis africanus* Motschulsky, 1863). Barron, J. R. 1971: 43 (syn. *Peltis yvani* Allibert, 1847). Borowiec, L. 1983: 14. Burakowski, B. et al. 1986: 119. Chang, T-C. & Liu, T.-Y. 1981: 116 (biology). Ghosh, S. & Haldar, D. P. 1989: 49 (biology). Ghosh, S. & Saha, K. 1992a: 181 (biology). Ghosh, S. & Saha, K. 1992b: 613 (biology). Ghosh, S. & Saha, K. 1995: 207 (biology). Halstead, D. G. H. 1968: 197 (biology). Klausnitzer, B. 1976: 7. Klausnitzer, B. 1978: 177. Klausnitzer, B. 1996: 163 (larva). Kolibáč, J. 1993a: 21. Kolibáč, J. 1999b: 12. Kolibáč, J. 2005: 67 (redescription). Kolibáč, J. 2006: 107 (larva). Kolibáč, J. 2007a: 366 (distribution). Lafer, G. Sh. 1992: 86. Nakane, T. et al. 1963: 182. Vogt, H. 1967: 16. Reitter, E. 1876: 63 (*Ostoma yvani*)

Genus *Lycoptis* Casey, 1890
http://species-id.net/wiki/Lycoptis
Map 13

Casey, T. L. 1890: 311, 494.

Type species. *Peltis americana* Motschulsky, 1863 [by monotypy]

Léveillé, A. 1910: 33. Barron, J. R. 1971: 120. Barron, J. R. 1975: 1117. Kolibáč, J. 2005: 67 (redescription). Kolibáč, J. 2006: 111 (phylogeny). Kolibáč, J. 2010: 35 (key).

Description. Body size: 1.9–2.2 mm. Body shape flat. Gular sutures wide, convergent at apex. Frontoclypeal suture broadly emarginate. Frons: longitudinal groove or depression absent. Submentum: ctenidium absent. Antennal groove absent. Eyes: size large, lateral. Eyes number: two. Lacinial hooks: three. Galea: shape elongate. Galea: ciliate setae absent. Mediostipes-Lacinia partially fused. Palpifer: outer edge even. Mandibular apical teeth number: two, horizontally situated. Mola present. Penicillus (at base) absent. Pubescence above mola or cutting edge absent. Ventral furrow absent. Basal notch moderate. Labrum-Cranium not fused. Ligula: ciliate setae absent, not retroflexed, deeply emarginate. Antenna 7-segmented, sensorial fields absent. Front coxal cavities externally open, internally open. Pronotum transverse. Elytra: long hairs absent. Epipleuron moderate. Elytral interlocking mechanism absent, carinae conspicuous. Elytral punctation regular, scales absent. Wing: radial cell moved down, often small, wedge cell absent, cross vein MP3-4 absent, cross vein AA1+2-3+4 absent. Front tibiae: spines along side moderate. Hooked spur present. Claws: denticle absent. Spiculum gastrale present. Tegmen composed of two parts.

Biology. *Lycoptis americana* is a very rare beetle, probably fungivorous. Barron (1975) noted that it was "*collected under bark of* Carya".

Distribution. USA: Georgia, Maryland, North Carolina, South Carolina (Barron 1975).

Species:

americana Motschulsky, 1863; USA: Georgia, Maryland, N Carolina, S Carolina (JRB)

Léveillé, A. 1910: 27 (*Lophocateres americanus* Motschulsky, 1863). Léveillé, A. 1910: 33 (*Lycoptis villosa* Casey, 1890). Barron, J. R. 1971: 120 (syn. *Lycoptis villosa* Casey, 1890). Barron, J. R. 1971: 120 (*Peltis americana* Motschulsky, 1863; comb.). Barron, J. R. 1975: 1120. Kolibáč, J. 2005: 67 (redescription)

Genus *Peltonyxa* Reitter, 1876
http://species-id.net/wiki/Peltonyxa
Figs 1, 12; Map 13

Reitter, E. 1876: 46.

Type species. *Peltonyxa deyrollei* Reitter, 1876 [by monotypy]

Léveillé, A. 1910: 24. Kolibáč, J. 2005: 76 (redescription). Kolibáč, J. 2006: 111 (phylogeny). Kolibáč, J. 2010: 35 (key). Matthews, E. G. 1992: 3.

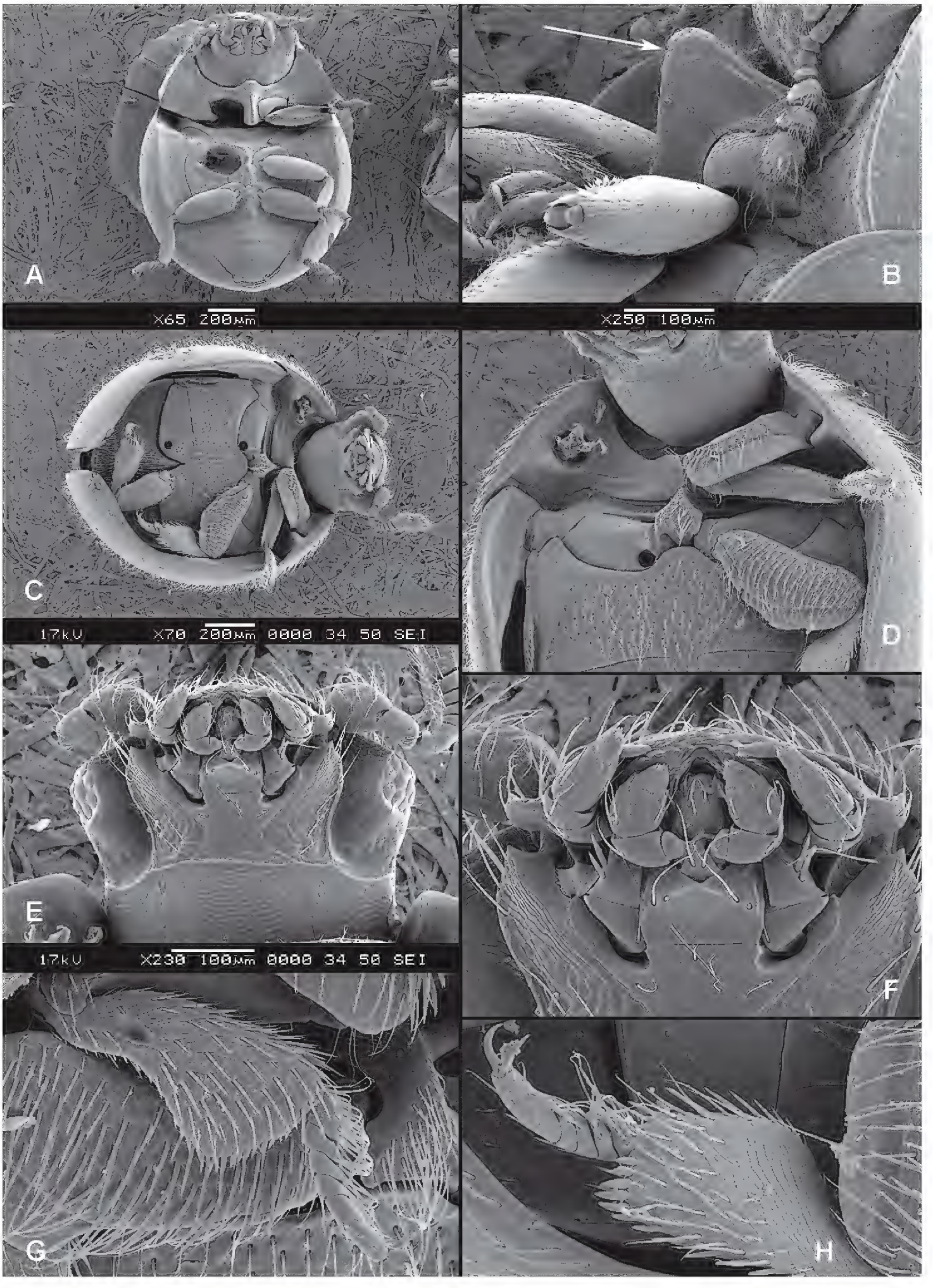


Figure 17. A–B "*Rentonellum*" *loebli* (**A** ventral surface **B** prosternal intercoxal process) **C** *cf. Globorentonium plaumanni*, Brazil (**C** ventral surface **D** pro- and mesothorax ventrally **E** head ventrally **F** detail of mouthparts **G** protibia with tarsus **H** mesotibia with tarsus).

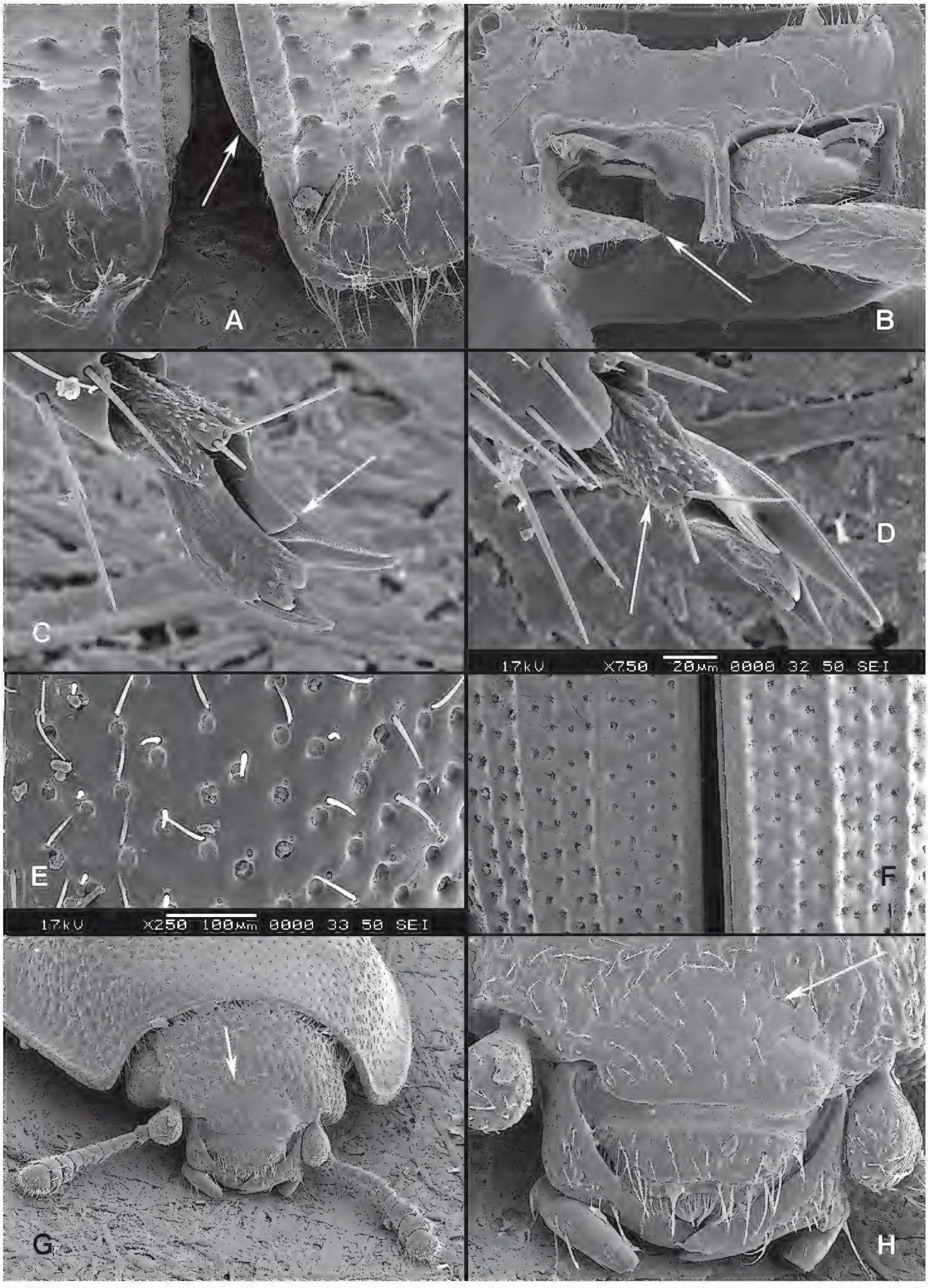


Figure 18. A *Thymalus limbatus*, elytral apex with interlocking mechanism **B–E** *Decamerus haemorhoidalis* (**B** prothorax with partially closed procoxal cavities **C** metatarsal claws with denticle **D** protarsus with projecting empodium **E** irregular punctation of elytra) **F** *Grynocharis oblonga*, elytral sculpture **G–H** *Lophocateres pusillus* (**G** head in frontal view with deeply emarginate frontoclypeal suture **H** detail).

Floricateres Crowson, 1970 [Type species: *Floricateres pusillus* Crowson, 1970]
Crowson, R. A. 1970: 10. Kolibáč, J. 2005: 76 (syn. *Floricateres*).

Description. Body size: about 3.5 mm. Body shape flat. Gular sutures wide, subparallel. Frontoclypeal suture broadly emarginate. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum of males: ctenidium present. Antennal groove present. Eyes: size moderate. Eyes number: two. Epicranial acumination moderate. Lacinial hooks absent. Galea: shape very small. Galea: ciliate setae absent. Mediostipes-Lacinia not fused. Palpifer: outer edge even. Mandibular apical teeth number: two, horizontally situated. Mola absent. Penicillus (at base) absent. Pubescence above mola or cutting edge absent. Ventral furrow absent. Basal notch moderate. Labrum-Cranium not fused. Epipharyngial sclerite absent. Lateral tormal process: projection projection reduced or absent (*Promanus*). Ligula: ciliate setae absent. Ligula membranous, not retroflexed, deeply emarginate. Hypopharyngeal sclerite H-shaped. Antenna 9-segmented. Antennal club weakly asymmetrical, sensorial fields absent. Front coxal cavities externally open, internally open. Pronotum transverse. Prepectus present. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron moderate. Elytral interlocking mechanism absent, carinae conspicuous or reduced. Elytral punctation regular, scales absent. Wing: radial cell moved down, often small, wedge cell absent, cross vein MP3-4 absent, cross vein AA1+2-3+4 absent. Front tibiae: spines along side moderate. Hooked spur present. Claws: denticle absent. Spiculum gastrale present. Tegmen composed of three parts. Coxitae divided.

Biology. *Peltonyxa pusillus* was collected on the flowers of *Bursaria* (Crowson 1970). South Australian species occur in the sclerophyll and Eremaean zones (Matthews 1992).

Distribution. Australia: South Australia, New South Wales, Victoria.

Species:

australis Blackburn, 1891; S Australia (AL)
Léveillé, A. 1910: 24

deyrollei Reitter, 1876; Australia (AL)
Léveillé, A. 1910: 24. Kolibáč, J. 2005: 76. Reitter, E. 1876: 46

invalida Blackburn, 1902; Australia („Nov. Gall. mer.") (AL)
Léveillé, A. 1910: 24

pubescens Blackburn, 1891; Australia: Victoria (AL)
Léveillé, A. 1910: 24

pusillus Crowson, 1970; Australia: NSW (RAC)
Crowson, R. A. 1970: 11 (*Floricateres*)

Genus *Promanus* Sharp, 1877

http://species-id.net/wiki/Promanus
Fig. 12; Map 13

Sharp, D. 1877: 267.

Type species. *Promanus depressus* Sharp, 1877 [by monotypy]

Léveillé, A. 1910: 29. Crowson, R. A. 1964a: 298. Kolibáč, J. 2005: 78 (redescription). Kolibáč, J. 2006: 111 (phylogeny). Kolibáč, J. 2010: 35 (key). Kolibáč, J. et al. 2010: 36.

Description. Body size: 6.8–8.8 mm. Body shape flat. Gular sutures wide, convergent at apex. Frontoclypeal suture broadly emarginate. Frons: longitudinal groove or depression absent. Cranium ventrally: tufts of long setae at sides absent. Submentum: ctenidium absent. Antennal groove present. Eyes: size large, lateral. Eyes number: two. Epicranial acumination absent. Lacinial hooks: two. Galea: shape subclavate. Galea: ciliate setae absent. Mediostipes-Lacinia fused together. Palpifer: outer edge even. Mandibular apical teeth number: two, horizontally situated. Mola absent. Penicillus (at base) present (fine, often membranous). Pubescence above mola or cutting edge absent. Ventral furrow absent. Basal notch shallow or absent. Labrum-Cranium not fused. Epipharyngial sclerite absent. Lateral tormal process: projection projection reduced or absent (*Promanus*). Ligula: ciliate setae absent. Ligula membranous, not retroflexed, deeply emarginate. Hypopharyngeal sclerite H-shaped. Antenna 11-segmented. Antennal club weakly asymmetrical, sensorial fields absent. Front coxal cavities externally open, internally open. Pronotum transverse. Prepectus present. Middle coxal cavities open. Elytra: long hairs absent. Epipleuron moderate. Elytral interlocking mechanism absent, carinae reduced. Elytral punctation regular, scales absent. Wing: radial cell moved down, often small, wedge cell absent, cross vein MP3-4 absent, cross vein AA1+2-3+4 absent. Front tibiae: spines along side moderate. Hooked spur present. Claws: denticle absent. Parasternites number along ventrites III–VII: two. Coxitae divided.

Larva: Frontal arms V-shaped. Epicranial stem absent. Endocarina present. Gular sutures conspicuous, convergent. Gula: anterior apodemes absent. Paragular sclerites absent. Hypostomal rods absent. Stemmata number: two. Mandibular apical teeth number: two, horizontally situated. Lacinia mandibulae plumose. Mola absent. Maxillary palpi 3-segmented. Pedunculate seta present. Mala: bidentate protrusion absent. Cardo-Stipes not fused. Cardo: size nearly as large as stipes. Labial palpi 2-segmented. Prementum in single part, anterior margin even. Antennal joints 1 and 2 elongate. Sensory appendix very small. Abdominal segment IX transversely divided. Tergite IX flat. Urogomphi present, hooked; median process present.

Biology. The adults and larvae are predatory. Crowson (1964a) found insect fragments in the gut of both stages.

Distribution. New Zealand.

Species:

auripilis Broun, 1893; New Zealand (AL)

Léveillé, A. 1910: 29. Kolibáč, J. et al. 2010: 36 (redescription)

depressus Sharp, 1877; New Zealand (AL)

Léveillé, A. 1910: 29. Crowson, R. A. 1964a: 298 (larva). Kolibáč, J. 2005: 78 (redescription). Kolibáč, J. et al. 2010: 36

subcostatus Broun, 1909; New Zealand (AL)

Léveillé, A. 1910: 29. Kolibáč, J. et al. 2010: 36 (redescription)

† Genus *Promanodes* Kolibáč, Schmied, Wappler & Kubisz, 2010

http://species-id.net/wiki/Promanodes
Map 13

Kolibáč, J. et al. 2010: 31.

Type species. *Promanodes serafini* Kolibáč, Schmied, Wappler & Kubisz, 2010 [by monotypy and author's designation].

Schmied, H. et al. 2009: 105 (distribution). Kolibáč, J. 2011: 58.

Description. Body size: 3.1–5.1 mm. Procoxal cavities nearly closed; maxillary palps with securiform terminal joint; extraordinarily elongate terminal segment of labial palps (distinctly longer or as long as two preceding segments together); slender and elongate tarsi in all pair of legs (approximately as long as tibiae); tibiae without "hooked" apical spine; procoxal cavities nearly closed or maybe perfectly closed in the new species; six visible abdominal ventrites; 10-segmented antennae; flat body; antennal club large and loose, 3-segmented; mesocoxae weakly transverse; elytra with distinct carinae. (Genus diagnosis after Kolibáč 2011.)

The new genus is very similar to the recent *Promanus*, the both genera share deep and incurvate frontoclypeal suture, distinctly elevated eyes, weakly or no way projecting anterior pronotal corners, elytra with weak or inconspicuous carinae widest at about 2/3 of length, radial cell obliquely situated, dorsal body surface sparsely pubescent or nearly bare, femora conspicuously clavate, very small trochanters, and especially abdomen with six visible ventrites. Body length 3–5 mm. (According to Kolibáč et al. 2010.)

Distribution. (Map 13.) Baltic amber: Poland, East Baltic coast(?); Tertiary: Eocene.

Species:

† *alleni* Kolibáč, 2011; Baltic amber: East Baltic coast(?); Tertiary: Eocene (JK)

Kolibáč, J. 2011: 59

† *serafini* Kolibáč, Schmied, Wappler & Kubisz, 2010; Baltic amber: Poland; Tertiary: Eocene (varA)

Schmied, H. et al. 2009: 105 (distribution). Kolibáč, J. et al. 2010: 36. Kolibáč, J. 2011: 59

Genus *Trichocateres* Kolibáč, 2010

http://species-id.net/wiki/Trichocateres
Fig. 12; Map 13

Kolibáč, J. 2010: 35.

Type species. *Trichocateres fasciculifer* Kolibáč, 2010 [by monotypy and author's designation].

Description. Body size: 5.2–5.5 mm. With general characteristics of the tribe Lophocaterini (body oval, frontoclypeal suture deeply arcuate, antennal club weakly asymmetrical, mandibular mola present, base of mandible with membranous appendage/penicillus, prostheca composed of tuft of setae, lacinia with spines). It is most

closely related to *Lophocateres*, *Indopeltis* and *Grynocharis* (mandibular mola present, elytral carinae well-developed).

Similarities of *Trichocateres* with *Lophocateres* and *Indopeltis*: the mandible with membranous penicillus and distinct prostheca; the wing venation with cross-veins MP3-4 and AA1+2-3+4 absent; and the metendosternite with robust stalk and widely separated anterior tendons. It resembles *Indopeltis* in aedeagus with projecting phallobasic apodeme, eyes similarly shaped, relatively large and situated dorsally, and lateral edge of pronotum undulating, whereas *Lophocateres* parallels include labrum with tormal processes branched at base and maxilla with mediostipes not fused with lacinia. Excluding the characters mentioned, *Trichocateres* differs from all three abovementioned genera chiefly in tibial spur pattern 1-1-1, two sharp grooves in prosternal process and tufts of long hairs on elytra and pronotum. (Genus diagnosis after Kolibáč 2010.)

Biology. The circumstances of collection are not exactly known; the specimens were knocked down from branches or fallen timber. Remnants of insect cuticle were found in the gut of the Assam specimen, the remains of an insect larva in the gut of the Laos specimen.

Distribution. India: Assam, northern Laos.

Species:

fasciculifer Kolibáč, 2010; NE India: Assam, N Laos (JK)

Kolibáč, J. 2010: 36

Species *incertae sedis*

***Calitys africana* Boheman, 1848** (Cucujoidea?)

Léveillé, A. 1910: 24.

Note: I studied only one non-type specimen determined as *C. africana* in the Museé d'Histoire Naturelle in Geneva. The specimen does not belong in Cleroidea.

***Latolaeva brasilica* Perty, 1830** (Cucujoidea?)

Reitter, E. 1876: 51.

Note. I have not studied any specimens of the species. The autochthonous distribution of *Latolaeva* or *Ancyrona* in South America is unprobable, although introduction is possible. Species of the two genera could be misidentified for an autochthonous or introduced Australian *Neaspis* or *Peltonyxa* (see "Distribution" for *Neaspis*).

***Ostoma australis* Boisduval, 1835**

Léveillé, A. 1910: 31.

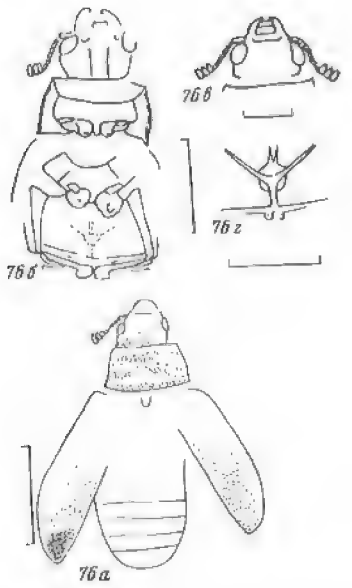


Figure 19. *Cretocateres mongolicus* Ponomarenko, 1986. A reproduction of the original table.

Ostoma higonia Lewis, 1894

Léveillé, A. 1910: 31.

Ostoma pubescens Escherich, 1822

Léveillé, A. 1910: 32.

Taxa occassionally or temporarily classified within Trogossitidae

Coleoptera *incertae sedis*

† Genus *Anhuistoma* Lin, 1985

http://species-id.net/wiki/Anhuistoma

Lin, Q.-B. 1985: 309 (Trogossitidae).

Type species. *Anhuistoma hyla* Lin, 1985 [designated by author and by monotypy]

Kolibáč, J. & Huang, D.-Y. 2008: 136 (Coleoptera *incertae sedis*).

Remarks. This beetle was originally described in Trogossitidae and later removed from the superfamily as Coleoptera *incertae sedis*.

Original description of the genus. "*A broadly elliptic beetle of small size; pronotum broadly hemiorbicular* (hemispherical?)*; elytra short and broad, ornamented with many longitudinal striae; legs short, three pairs of coxae clearly separated, fore-coxa transverse, mid-coxa rounded, both posterior coxae transverse and connected with each other; abdomen with 5 visible sternites.*" (Lin 1985: 309)

Original description of the species. "*The body of a small beetle with head and legs missing, 3.5 mm long and 2.3 mm wide. Body broadly elliptic. Pronotum in hemiorbicular* (hemispherical?) *form, slightly broader than long; anterior margin of pro-*

168 SUPPLÉMENT.

107.	Necrobia violacea.	212.	Opetiopalpus scutellaris.
208.	» tibialis.	213.	» luridus.
209.	» defunctorum.	214.	» collaris.
210.	» bicolor.	215.	Paratenetus punctatus.
211.	Opetiopalpus auricollis.	216.	» Lebasii.

Total, 235 espèces, en y comprenant celles dont le genre m'a paru douteux. Ajoutons-en 17 du Chili qui entreront dans le voyage de M.r Gay, et les 44 de M.r Klug cottées — *O.* Le nombre des *Clérites* connus montera au moins à 296 espèces. Je dis au moins parce qu'il est plus que probable que toutes les espèces du savant de Berlin cottées —? ne sont pas de simples variétés. A la vérité, il faudra peut-être en défalquer quelques variétés réelles que je puis avoir pris pour des espèces parceque je n'en ai eu qu'un seul exemplaire à ma disposition. Mais maintenant au lieu de me prononcer sur ces autres *Clérites* que je n'ai pas vus, au lieu de pousser plus loin des recherches synonimiques qui seraient nécessairement incomplettes et hazardées puisque je n'aurais ici d'autres ressources que celles de mon propre cabinet, je vais entrer dans quelques détails sur deux genres de même ordre et qu'on a pu croire de la même famille. Le premier est mon *G. Dupontiella* que j'avais pris moi-même pour un *Clérite*. Le seconde est le *G. Eurypus Kirby* que son auteur avait placé dans les *Clerii* et que M.r Klug a proposé de placer dans la section des *Hétéromères*.

I.e G. DUPONTIELLA, *M.*

Antennes, placées au-devant des yeux, en face de l'échancrure oculaire, *de onze articles:* 1.er article, épais, obconique; art. 2—8, moitié plus minces, encore obconiques, le troisième un peu plus long que le second, les suivants à-peu-près

SUPPLÉMENT. 169

égaux entr'eux, les articulations assez distinctes; *trois derniers articles, formant ensemble une espèce de massue serriforme*, très aplatie et plus courte que les art. 2—8 réunis: art. 9.e et 10.e, de la même forme, en triangles curvilignes renversés, dilatés en dedans, ayant l'angle antéro-interne qui répond à la dent de la scie obtus et l'extrémité un peu échancrée, le neuvième aussi long que large, le dixième plus large que long; le dernier, pareillement dilaté en dedans, aussi large mais plus long que l'avant-dernier, ovale et terminé en pointe mousse.

Yeux, petits, peu saillants, finement grénus, très distants, en ovales longitudinaux, *échancrés en avant.*

Tête, très grande comme dans les *G. Cylidrus* et *Denops.* *Vertex*, spacieux, carré, se confondant insensiblement avec le *Front.* Celui-ci, doucement penché en avant, un peu concave, se confondant insensiblement avec la *Face* qui est également concave et de plus rétrécie et échancrée en avant. *Chaperon*, inapparent.

Labre, déprimé, transversal, n'atteignant pas l'extrémité des mandibules croisées, fortement échancré en avant: échancrure, aiguë et profonde.

Mandibules, grandes et très fortes, épaisses et rapprochées dès leur origine: face externe, très élevée, sans arêtes qui la séparent nettement des faces supérieure et inférieure, uniformément convexe, en surface de cone courbé en dedans; arête interne, mince, droite, denticulée, plus largement échancrée près de l'extrémité, terminée en pointe courbe et tranchante.

Palpes maxillaires, de quatre articles: le dernier, non aplati, renflé vers le milieu, terminé en pointe mousse.

Palpes labiaux, n'étant pas plus grands que les maxillaires, de trois articles: le dernier, aplati, en palette ovale qui a son maximum de largeur à peu de distance de l'extrémité, celle-ci doucement arrondie.

Autres *Parties de la bouche*, inobservées.

170 SUPPLÉMENT.

Corps, étroit et cylindriforme comme dans les *G. Cylidrus* et *Denops:* formes et dimensions relatives de ses différentes pièces, à-peu-près les mêmes.

Prothorax, composé de deux pièces seulement, comme dans les trois premières sous-familles de nos *Clérites*. *Fosses coxales antérieures*, entièrement fermées.

Élytres, entourant l'extrémité de l'abdomen: côtés, droits et parallèles.

Poitrine et *Ventre*, très faiblement convexes.

Pattes, hors les tarses, comme dans le *G. Denops.*

Tarses, filiformes, de cinq articles également libres et indépendants: *les quatre premiers*, à-peu-près égaux entr'eux, tronqués ou faiblement échancrés en dessus, *tapissés en dessous de poils fins et soyeux* qui laissent cependant à nu à la ligne médiane, *mais complettement dépourvus d'appendices membraneux:* le dernier, plus long que chacun des précédents, terminé par deux crochets simples.

Dupontiella ichneumonoides.

Dup. *Tab.* xii, *fig.* 4. (15)

Clerus ichneumonoides, *Dup. coll.*

Patrie. — La Colombie, M.r Lebas.

Dimensions. — Long. du corps, 2 lig. — id. de la tête, ½ lig. — id. du prothorax, la même. — id. des élytres, 1 lig. — larg. de la tête, ½ lig. — id. du bord antérieur du prothorax, la même. — id. de la base des élytres, ½ ligne.

Formes. — Antennes, n'atteignant pas le bord postérieur du prothorax. Face, tri-échancrée: échancrure médiane, laissant le labre en évidence; échancrures latérales, obliques d'avant

(15) La figure de l'insecte entier donne aux antennes un peu trop de longueur relative. Les vraies proportions ont été observées plus fidèlement, dans le dessin particulier de la tête qui a été fait sur une plus grande échelle.

SUPPLÉMENT. 171

en arrière et de dedans en dehors, placées à l'origine supérieure des mandibules. Ponctuation du devant de la tête, très forte: points, arrondis au vertex, oblongs au front, linéaires et rugiformes à la face. Dos du prothorax, plus inégalement ponctué: des points plus gros et plus distants, épars sur le disque; espaces intermédiaires, finement et visiblement pointillés; dépression antérieure, assez apparente. Côtés, un peu arqués et dilatés au-delà de cette dépression, atteignant le maximum de la largeur vers la moitié de la longueur, convergents ensuite sans être rentrants ou infléchis: sillon sous-marginal, large et profond; bord postérieur, plus étroit que le bord opposé, rebordé à rebord épais et élevé. Surface des élytres, inégale: callus, lisses et saillants; deux autres élévations, également lisses; la première plus grande vers le milieu de l'élytre et près de la suture, en forme de croissant dont les cornes sont tournées en dehors; la seconde vis-à-vis du centre du croissant, en bande transversale, partant du milieu du dos et atteignant le bord extérieur; reste de la surface, mat, finement pointillé, sans aucune trace de stries; côtés, parallèles de la base jusqu'aux quatre cinquièmes de la longueur; extrémité, en arc de cercle; angle sutural postérieur, fermé. Pélage, inégal, long et hérissé aux gros points de la tête et du prothorax, court et ras aux espaces pointillés du prothorax et des élytres, rares et courts aux pattes et au dessous du corps, nuls aux callus et aux autres élévations des élytres.

Couleurs. — Antennes, rougeâtres: massue antennaire, noire. Tête, noire; labre, palpes et autres parties de la bouche hors les mandibules, rougeâtres. Prothorax, noir: dépression antérieure, brune ou ferrugineuse. Élytres, noires: callus, ferrugineux; autres élévations, blanches. Dessous du corps, noir. Pattes, brunes: extrémités des fémurs et des tibias, noirs; la couleur la plus obscure, dominant davantage aux deux premières paires. Poils, hérissés, blanchâtres: duvet ras, noir; quelques bandes ondulées sur les élytres, blanc de neige.

Figure 20. A facsimile of Spinola 1844: 168–171. The original descriptions of the genus *Dupontiella* and the species *D. ichneumonoides*.

172 SUPPLÉMENT.

Sexe. — Douteux.

Obs. — La structure des mandibules de notre *Dupontiella* mérite toute notre attention. En les comparant avec celles de la plupart de nos *Clérites*, on reconnaît qu'elles ont plus de force pour fouïr la terre et pour perforer le bois, tandis-qu'elles ont moins d'agilité pour mordre les larves ou les autres petits animaux dont les téguments opposent peu de resistance. Y aurait-il quelque rapport entre cette structure des mandibules et les habitudes de la *Dupontiella* dans l'un quelconque de ses états? La larve serait-elle en effet peu carnassière? Ce genre n'aurait-il pas plus d'affinités avec certains *Xylophages* et notamment avec les *Trogosites* et avec les *Colydies*?

Ces reflexions ne s'appliquent cependant pas à l'espèce qui a été représentée à la *Pl.* VIII, *fig.* 5 et à la quelle j'ai donné le nom de *Dupontiella fasciatella*, nom qu'il faudra sans doute reformer lorsque les caractères du genre seront mieux connus. Je n'en ai vu qu'un seul exemplaire communiqué par M.r Buquet. Il avait beaucoup souffert dans le trajet de Paris à Gênes et ses tarses étaient arrivés dans un état pitoyable. N'ayant pas apperçu de traces d'appendices, je l'ai réuni avec doute à la *Dupontiella*. Mais mes doutes sont d'autant mieux fondés que je n'ai pas même réussi à compter le nombre des articles, ensorte que le dessin qui en offre cinq n'est au fond qu'une divination très hazardée. Plusieurs traits extérieurs rapprochent d'ailleurs cet insecte du *G. Denops*. Telles sont les mandibules de la forme ordinaire, la face antérieurement arrondie et non triéchancrée, le labre plus grand et plus largement échancré, le front non concave, plane ou faiblement convexe. Les autres parties de la bouche et les pièces génitales n'étaient pas en évidence. Je ne puis en rien dire.

La *Dup. fasciatella* est plus petite que l'*Ichneumonoides*, long. du corps, 1 et ½ ligne, les proportions relatives des pièces de l'avant-corps étant d'ailleurs les mêmes: arrière-corps, proportionnellement plus étroit, base des élytres de la même largeur que la tête et que le bord antérieur du prothorax. Dessus du corps, luisant, totalement dépourvu de duvet velouté et n'ayant que des poils épars fins et hérissés. Ponctuation de l'avant-corps, égale, moyenne et distincte. Surface des élytres, uniformément convexe: callus huméraux, non saillants; gibbosités derrière les callus, nulles; dix rangées longitudinales et parallèles de points enfoncés assez grands et équidistants, partant de la base et dépassant le milieu; espaces intermédiaires, lisses à l'œil nu. Antennes, pattes, labre et palpes, jaunes. Corps, noir en dessus: un peu au-delà du milieu de chaque élytre, une bande transversale d'un blanc sale ou jaunâtre, partant du bord extérieur et n'atteignant pas la suture. — Sexe, douteux.

Amérique méridionale, collection Buquet.

173 SUPPLÉMENT.

II. G. EURYPUS, *Kirby*.

Antennes, distantes, naissant à quelque distance et en avant des yeux, *de onze articles:* le premier, épais, obconique, remontant tout au plus à la moitié de la hauteur des yeux; le second, plus mince et plus court, pareillement obconique; le troisième, un peu plus court, mais de la même forme et de la même épaisseur que le précédent; *les art.* 4—10, à-peu-près égaux entr'eux, applatis, en triangles renversés et dilatés en dedans, *formant ensemble une espèce de scie à dents égales et aiguës;* le dernier, plus étroit et plus allongé que chacun des précédents, en ovale longitudinal rétréci à son origine et arrondi à son extrémité.

Yeux, distants, latéraux, de moyenne grandeur, peu saillants en dehors, ne touchant pas le bord antérieur du prothorax, *presque orbiculaires, coupés en ligne droite et non échancrés en avant.*

Tête, ovalaire. *Vertex*, large, court, en trapèze un peu rétréci en arrière. *Front*, plane, doucement penché en avant,

25

Figure 21. A facsimile of Spinola 1844: 172–173. The original descriptions of the species *Dupontiella ichneumonoides* and *D. fasciatella*.

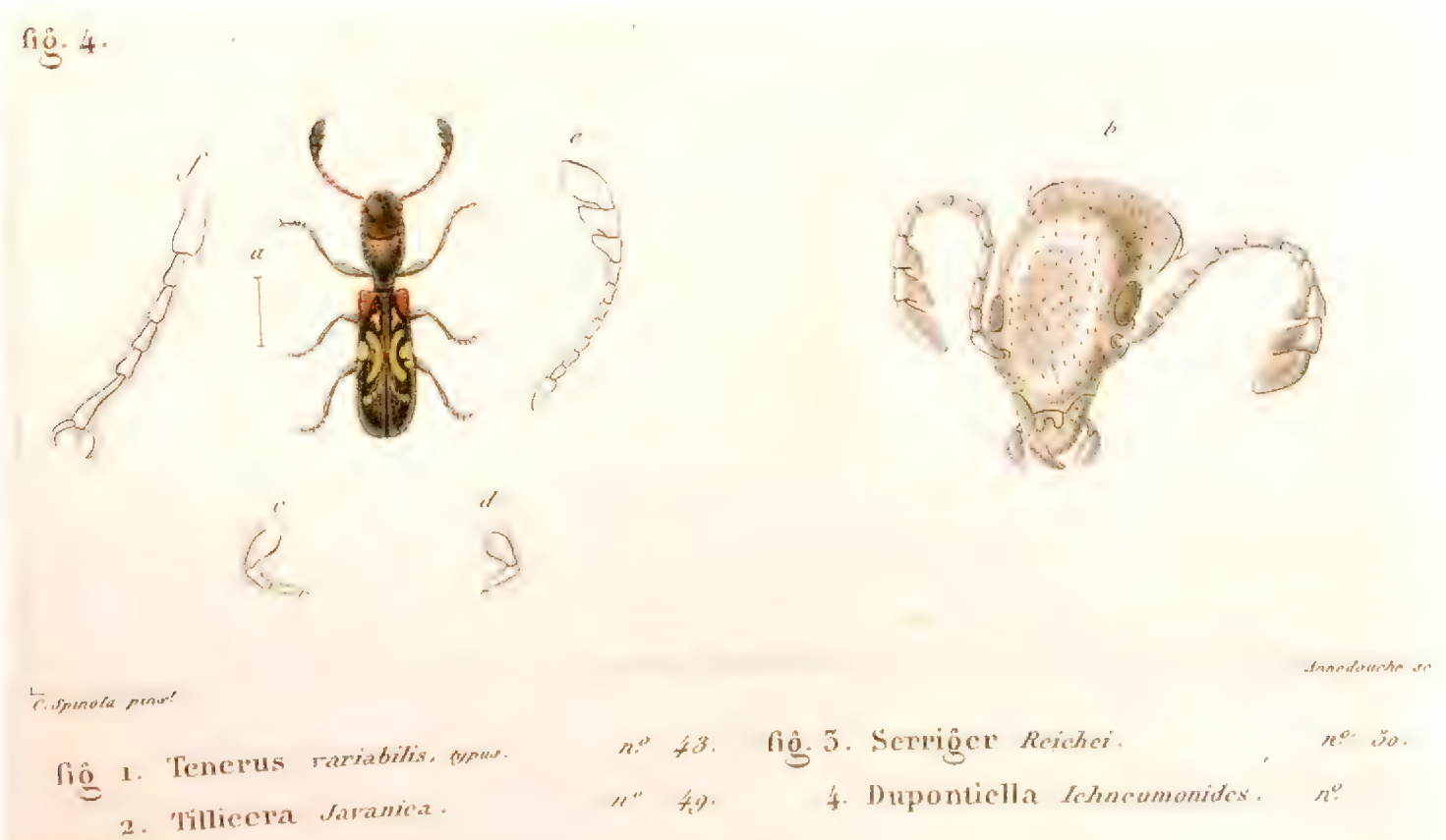


Figure 22. A facsimile of Spinola 1844: Tab XII, fig. 4 (15). The original illustrations of *Dupontiella ichneumonoides*.

14

Unterscheidet sich von *elongatum* durch bedeutendere Grösse, deutlichere Punktirung und besonders durch die gelblichrothe Binde, welche fast die vordere Hälfte des Halsschildes einnimmt.

II. Antennae undecimarticulatae.

4. *Nemozoma cornutum*: *Nigrum, nitidum, glabrum, capite thoraceque minus crebre distincte punctatis, antennis pedibus elytrisque basi ferrugineis, his subtiliter fere seriatim punctatis, stria suturali apice profunde impressa.* *Long. 5 mm.*

Strm. Cat. 1826. 77. Taf. 4. Nr. 32.

Patria: Caucasus.

B. Antennarum clava ovalia, haud obtuse subserrata, (unilaterali). Antennae undecimarticulatae.

5. *Nemozoma nigripennis*: *Ferrugineum, nitidum, glabrum, vix perspicuum obsolete punctulatum, capite thorace parum longiore, dorso prothoracis postice longitudinaliter subcanaliculato; elytris nigro-piceis, subtiliter striatis, stria suturali vix magis impressa.*

Patria: Columbia, (Paime.) *(Mus. Degrolle.)* *Long. fere 5 mm.*

Mir unbekannte Arten.

6. *Nemozoma cylindricum*: *„Lineare cylindricum, nitidum, capite thoraceque subtilius punctatis, illo rufescente, hoc nigro, elytris nigro-piceis, subtiliter striatim punctatis, interstitiis parce punctulatis, basi apiceque rufescentibus, subtus rufo-piceum, antennis pedibusque rufo-testaceis.* *Long. 0.18 ".*

Patria: Amer. bor.

Lec. Nev. spec. Col. I. 1863. 65.

Wie es scheint, eine mit unseren europäischen nahe verwandte Art.

7. *Nemozoma parallelum*, *Melsh.* Proc. Ac. Phil. II. 108.

Gleich breit, leicht niedergedrückt, kastanienbraun, die Flügeldecken etwas heller, Palpen rothbraun.

Patria: Amer. bor.

Eine mir unbekannte Art aus Madagascar beschrieb kürzlich noch *Fairmaire.*

15

7. Genus Dupontiella Spinola.

Mon. Clerites II. 170.

Oculi duo laterales, subrotundati, depressi. Antennae undecimarticulatae, clava triarticulata. Frons trisinuata. Prothorax postice coarctatus. Elytrorum angulis humerali extus acuto-productis. Pedes graciliores, tibiae muticae. Corpus subcylindricum, opacum, haud evidenter punctulatum.

Körperform ähnlich jener von *Nemozoma* und sehr an die *Cleriden* erinnernd, etwa an *Denops* und *Clerus.* Kopf mindestens von der Breite des Halsschildes, gross, etwas länger als breit; Stirn am Vorderrande, wie bei *Trogosita (Temnochila)* dreibuchtig. Oberlippe wie bei *Trogosita,* vorragend, längs vertieft, behartet. Oberkiefer sehr kräftig, vorragend, an der einfachen Spitze gekreuzt, hinter der letzteren mit einem stumpfen Zahne. Fühler 11gliederig, wie bei *Nemozomia;* ebenso die Endglieder der Taster. Augen fast rund, sehr flach gewölbt. Halsschild länger als breit, gegen die Basis etwas verschmälert, am Grunde eingeschnürt. Schildchen sehr klein. Flügeldecken gleich breit, an der Spitze abgerundet, den Hinterleib vollkommen bedeckend, mit scharf spitzigen, als ein kleines Zähnchen vertretenden Schulterecken. Scheibe derselben wie des übrigen Körpers kaum punktirt, ganz matt. Prosternum hinter den Hüften herabgebogen, zwischen denselben mit einer breiten aber flachen Furche. Schienen einfach, unbewehrt. Männchen (?) mit einem sechsten kleinen Bauchsegmentchen. Die einzelnen Bauchsegmente gegen die Spitze kleiner werdend.

Diese ebenso schöne als ausgezeichnete Gattung wurde von *Spinola* unter die *Cleriden* gezogen; sie ist aber, wie *Chevrolat* mir brieflich ganz richtig bemerkte, ein ächter *Trogositidae,* und zwar in die nächste Verwandtschaft zu *Nemozoma* gehörig. Die spitzig erweiterten Schulterwinkeln hat die Gattung mit den *Tenebrioides*-Arten gemeinsam.

1. *Dupontiella ichneumoides*: *Elongata, subcylindrica, nigra, subtomentoso-opaca, vix pubescens, capite obsolete-, thorace elytrisque vix punctatis, prothorace elongatim quadrato, postice coarctato; elytris subparallelis; macula humerali ferruginea, fascia media transversa lobato-interrupta flava et prope suturam ferruginea; antennis piceis, pedibus rufis.* *Long. 5 mm. — Taf. I. fig. 8.*

Patria: Caracas. *(Mus. Chevrolat.)*

Spinola Mon. II. (Essai monographique sur les Clerites 1844.) 170. Taf. X, fig. 4.

17, 111

16

Schwarz, matt, wie mit sammtartigen Toment überzogen, obzwar eine sichtbare Behaarung fehlt. Kopf fast breiter als das Halsschild, gross, mit den Mandibeln von der Länge der letzteren, oben seicht punktirt. Halsschild etwas länger als am abgestutzten Vorderrande breit, am Hinterrande stark eingeschnürt, die Seiten ohne Randkante. Schildchen punktförmig. Flügeldecken sowie das Halsschild kaum punktirt, Schultermakel rostroth, dann eine gezakte, mehrfach unterbrochene Querbinde in der Mitte gelb, die innerste etwas erweiterte Parthie derselben an der Naht roströthlich. Fühler pechbraun, Beine roth.

Diese Art der sehr seltenen Gattung war Herr *Chevrolat* in Paris so freundlich mir zur Ansicht mitzutheilen.

2. *Dupontiella fasciatella* *Spin.* l. c. 172. Taf. 8, fig. 5.

Caracas.

Sie ist viel kleiner als die vorhergehende, 1½ lin. lang, die Schulterwinkel weniger spitzig, ohne Schulterbeule, die Flügeldecken in Reihen punktirt, die letzteren hinter der Mitte verschwindend, Fühler, Beine, Palpen und Oberlippe gelb.

8. Genus Filumis Reitter.

Oculi duo laterales, rotundati, subdepressi. Antennae undecimarticulatae, clava biarticulata. Frons apice emarginata. Labrum elongato-quadratum, valde prominulum. Tibiae muticae. Corpus valde lineolatum, cylindricum, glabrum.

Körperform einer sehr langgestreckten *Nemozoma.* Kopf gross, sehr wenig breiter als das Halsschild und wenig länger als breit. Stirn vorn abgestumpft, und in der Mitte sehr schwach ausgebuchtet. Oberlippe als ein langer horniger Lappen vorragend, die Mandibeln bedeckend. Augen rund, kaum vorragend. Fühler 11gliederig, mit 2gliederiger Keule, deren erstes Glied kleiner ist als das zweite, und ähnlich wie bei *Acalanthis* gebildet. Endglied der Taster kleiner als bei *Nemozoma.* Fühlerrinnen kurz und tief, convergirend. Halsschild mehr wie doppelt so lang als breit, in der Mitte deutlich eingeschnürt, nirgends gerandet, von den Flügeldecken deutlich abgerückt. Schildchen klein, punktförmig. Flügeldecken cylindrisch, den Hinterleib ganz bedeckend, der letztere ohne 6. Segmentchen. (Nur beim ♀?) Prosternum hinter den Hüften lanzettförmig. Beine kurz, wie bei *Nemozoma.*

17

1. *Filumis tenuissima*: *Picco ferruginea, nitida, capite thoraceque confertim subtiliter punctatis, hoc valde elongato, in medio leviter coarctato; elytris dense striatis, interstitiis angustis, punctulatis stria suturali apice profunde impressa.* *Long. 6.5 mm., lat. 1 mm.*

Patria: Columbia. *(Coll. Steinheil.)* *Taf. I, fig. 9.*

Schmal, langgestreckt, fadenförmig, cylindrisch, braunroth, glänzend. Fühler und Beine etwas heller. Kopf halb so lang als das Halsschild, und wie das letztere gedrängt und fein punktirt. Halsschild 2½ mal so lang als breit, in der Mitte leicht eingeschnürt, die Seiten ohne Randkante, am abgestutzten Vorder- und Hinterrande gleich breit. Flügeldecken von der Breite des Halsschildes, 1¾ mal so lang als das letztere, dicht gestreift, die Streifen gegen die Seiten zu verschwommen, die Zwischenräume schmal, weitläufig fein punktirt; die Nahtstreifen an der Spitze furchenartig vertieft. Die 5 Bauchringe nahezu von gleicher Breite.

Tribus: Trogositini.

Kopf meist gross aber selten ganz so breit wie das Halsschild, niemals breiter als dieses. Augen quer, gross, meist nierenförmig. Die Seiten des Halsschildes deutlich gerandet, die Vorderecken desselben fast stets etwas vorragend. Prosternum stets breit, die Seiten jedoch, namentlich zwischen den Vorderhüften ungerandet. Körper unbehaart.

Conspectus generum.

A. Tibiae fortiter spinosae.

1a Antennarum clava articulis unilateralibus (obtuse subserrata). Thorax angulis anticis vix productis. Corpus cylindricum . . . . . **Airora.**

1b Antennarum clava articulis simplicibus, haud unilateralibus. Thorax angulis anticis parum productis.

2a Corpus cylindricum. Thorax plus minusve quadratus . . . . . **Allindria.**

2b Corpus plus minusve depressum.

Reitter, Trogositidae. 2a

Figure 23. A facsimile of Reitter 1876: 14–17. Author's remarks on the genus *Dupontiella* and the both species, *Dupontiella ichneumonoides* and *D. fasciatella.*

Genus: Thoracotes m.

Thoracotes dubius m. (Taf. XLI, Fig. 9.)

Fundort: Dobbertin in Mecklenburg. Oberer Lias.

Nitidulites argoviensis an Parnidium, Geinitz, Arch. Ver. Meckl. XLVIII, 76, t. 1, f. 17, 1894.

Ein 6 mm langer Käfer von ähnlicher Gestalt wie Parnidium Geinitzi.

Lias-Formation. 439

Der Prothorax ist aber anders geformt und nähert sich mehr der Kreisform, Auch der Kopf scheint anders gewesen zu sein. Flügeldecken punktiert, 3½mal so lang als breit.

Geinitz vergleicht diese Form mit Latridiites Schaumi, mit dem sie allerdings auch einige Ähnlichkeit hat.

Figure 24. A facsimile of Handlirsch 1906: 438–439. The original description of *Thoracotes dubius*.

Figure 25. A facsimile of Handlirsch 1906: Tab. XLI, fig. 9. The original illustration of *Thoracotes dubius*.

notum concave, posterior margin of pronotum as wide as the anterior. Anterior coxa transverse and disjointed. Mid-thorax slightly smaller than metathorax. Both mid-coxae rounded and disjointed from one another. Posterior coxae transversely connected. Elytra much broader at base, gradually narrowing toward apex, rounded at apical angle; surface covered with several longitudinal striae. Abdomen with 5 visible sternites." (Lin 1985: 309)

Species:

† *hyla* Lin, 1985; China: Anhui province; Mesozoic: Lower-Middle Jurassic

Lin, Q.-B. 1985: 309 (Trogossitidae). Kolibáč, J. 2006: 136 (Trogossitidae *incertae sedis*). Kolibáč, J. & Huang, D.-Y. 2008: 137 (Coleoptera *incertae sedis*)

† Genus *Peltocoleops* Ponomarenko, 1990

http://species-id.net/wiki/Peltocoleops

Ponomarenko, A. G. 1990: 73 (Cleroidea).

Type species. *Peltocoleops onokhojensis* Ponomarenko, 1990 (by monotypy and original designation)

Kolibáč, J. 2006: 129 (Lophocaterini). Ponomarenko, A. G. & Kireichuk, A. G. 2005–2008: http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm (Peltidae). Schmied, H. et al. 2009: 25 (Trogossitidae: Peltinae).

Remarks. The genus was established in Cleroidea, with no indication of an exact family classification (Ponomarenko 1990). Later, Ponomarenko and Kireichuk (2005–2008) listed it in Peltidae. I classified *Peltocoleops onokhojensis* within Lophocaterini but this opinion has to be revised here because it was based on mistranslation of antennal characteristics. The symmetrical club (not "weakly asymmetrical"), widely separated mesocoxae and obliquely situated metacoxae (Ponomarenko 1990: p. 73, 74; fig. 70b) exclude classification of the beetle within Cleroidea. It is therefore listed as Coleoptera *incertae sedis* herein.

Original diagnosis of the genus (translation from Russian). "*Medium sized, oval, flat beetle. Head short, gular sutures divergent backwards* [sic], *antennae long with indistinct symmetrical club. Pronotum wide and short, its base not narrower than elytra, front coxae large, transverse, not projecting, with exposed trochantin, prosternal process extending behind coxae, very slightly widened. Middle coxal cavities closed by mesepimeron. Middle coxal cavities large, rounded, with exposed trochantin. Metathorax transverse, weakly convex along join of legs* [sic], *hind trochantins* [sic] *oblique. Abdomen with 5 visible sternites, their bases bordered* (?). *Legs relatively long, outer side of middle tibiae with row of firm spines.*"

Original description of the species (translation from Russian). "*Head twice shorter than wide, tempora shorter than eyes, gula shorter than wide. Antennomere 6 reaches backwards base* [sic] *of pronotum. Pronotum evenly rounded anteriorly, 2.5 times shorter than wide, anterior margin straight, about twice narrower than basal margin. Prothorax short, shorter than front coxae, prosternal process distinctly runs behind coxae. Middle coxae relatively widely separated. Metathorax about 2.5 times shorter than wide along its basal margin. Hind coxa is longest along middle of body and 3.5 times shorter than wide* [sic], *coxae distinctly shortened at lateral end. The first and the last abdominal sternites conspicuously longer than others. Elytra widest at basal portion, glabrous. Middle femora scarcely project out of body outline, tibiae widened, with longitudinal sulcus with row of firm spines (or setae) along outer side, tibiae longer than femora.*" "*Length 7.2, width 4.1, length of elytra 5.2 mm.*"

Distribution. Russia: Transbaikalia, Onokhovo, Onokhovsky Graben, Baleysky distr., Chitinskaya obl.; Mesozoic: Early Cretaceous, Lower Neocomian, Leskovskaya Beds.

Species:

† *onokhojensis* Ponomarenko, 1990; Russia: Transbaikalia; Early Cretaceous, Lower Neocomian (varA)

Ponomarenko, A. G. 1990: 73. Ponomarenko, A. G. & Kireichuk, A. G. 2005–2008: http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm. Schmied, H. et al. 2009: 26

Superfamily Cucujoidea *incertae sedis*

† Subfamily Meligethiellinae Kireichuk & Ponomarenko, 1990

Remarks. Because Meligethiellinae is excluded from Cleroidea herein, the synonymization of the subfamily with Peltinae: Thymalini is no longer valid. Meligethiellinae should be classified within traditional Cucujoidea and it is probably related to the extant Nitidulidae. However, this issue lies beyond the scope of this communication and should be addressed by those working on Cucujoidea.

† Genus *Meligethiella* Medvedev, 1969
http://species-id.net/wiki/Meligethiella

Medvedev, L. N. 1969: 119 (Nitidulidae).

Type species. *Meligethiella soroniiformis* Medvedev, 1969 (by monotypy and original designation).

Kireichuk, A. G. & Ponomarenko, A. G. 1990: 81 (Peltidae: Meligethiellinae). Kolibáč, J. 2006: 126 (Thymalini). Ponomarenko, A. G. & Kireichuk, A. G. 2005–2008: http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm. Schmied, H. et al. 2009: 25.

Remarks. The genus was originally described in Nitidulidae (Medvedev 1969) and latter shifted to Peltidae by Kireichuk and Ponomarenko (1990) in the new extinct subfamily Meligethiellinae along with the genera *Juralithinus* and *Ostomalynus*. I accepted the classification within Trogossitidae: Peltinae. However, I synonymized Meligethiellinae and moved all three genera into the extant Thymalini (Kolibáč 2006). After more careful examination of their descriptions and original illustration, I found the classification of *Meligethiella* and *Ostomalynus* within Trogossitidae or even Cleroidea hardly possible while *Juralithinus* characters are fully compatible with the definition of Peltinae. The most important characters that exclude *Meligethiella* from Trogossitidae are (1) widely separated mesocoxae, especially in combination with (2) irregularly punctate elytra and (3) groove for prosternal process in mesosternum.

Original description of the genus (translation from Russian). "*Diagnosis: Body broadly oval, head not distinctly retracted into pronotum, pronotum just about narrower than elytra, 3–4 times shorter than elytra, middle coxae widely separated; mesothorax with groove for apex of prosternal process; elytra perfectly cover abdominal apex, smooth or with irregular punctation; femoral lines in metathorax* [paracoxal sutures?] *mostly well-developed; first visible abdominal sternite longer than following one.* [Measurements 3.7–4.7 mm.]"

Distribution. Russia: Bouriatskaya Autonomnaya Respublika; W Transbaikalia – Chitinskaya oblast; Kazakhstan: Chimkentskaya oblast, Baissa. Mesozoic: Late Jurassic: Karabastayskaya formation; Lower Cretaceous: Turginskaya formation; middle Neocomian: Zazinskaya formation.

Species:

† *glabra* Kireichuk & Ponomarenko, 1990; Russia: Transbaikalia, Chitinskaya obl.; Lower Cretaceous, Turginskaya formation (varA)

Kireichuk, A. G. & Ponomarenko, A. G. 1990: 82. Ponomarenko, A. G. & Kireichuk, A. G. 2005–2008: http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm. Schmied, H. et al. 2009: 25

† *kovalevi* Kireichuk & Ponomarenko, 1990; Kazakhstan: Chimkentskaya obl.; Late Jurassic: Karabastayskaya formation (varA)

Kireichuk, A. G. & Ponomarenko, A. G. 1990: 81. Ponomarenko, A. G. & Kireichuk, A. G. 2005–2008: http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm. Schmied, H. et al. 2009: 25

† *soroniiformis* Medvedev, 1969; Russia: Bouriatskaya Autonom. Rep., Baissa; Lower Cretaceous: Zazinskaya formation (varA)

Kireichuk, A. G. & Ponomarenko, A. G. 1990: 81. Medvedev, L. N. 1969: 120. Ponomarenko, A. G. & Kireichuk, A. G. 2005–2008: http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm. Schmied, H. et al. 2009: 25

† Genus *Ostomalynus* Kireichuk & Ponomarenko, 1990

http://species-id.net/wiki/Ostomalynus

Kireichuk, A. G. & Ponomarenko, A. G. 1990: 82 (Peltidae: Meligethiellinae).

Type species. *Ostomalynus ovalis* Kireichuk & Ponomarenko, 1990 (by monotypy and original designation)

Kolibáč, J. 2006: 126 (Thymalini). Ponomarenko, A. G. & Kireichuk, A. G. 2005–2008: http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm. Schmied, H. et al. 2009: 25.

Remarks. The genus was described in Meligethiellinae by Kireichuk & Ponomarenko (1990) and latter shifted to Thymalini by (Kolibáč 2006, Schmied et al. 2009). It is apparently related to *Meligethiella*, so both genera must be removed together from Trogossitidae and Cleroidea.

Original description. "*Body oviform, strongly narrowed posteriorly. Pronotum short, five times shorter than elytra, prothorax very short, nearly lenticular, with strong longitudinal keel along centre, middle coxae widely separated, anterior part of mesothorax with groove for apex of prosternal process, elytra reaching behind end of abdomen, dorsally with thin lines beneath them longitudinal rows of punctures can be visible.* [Measurements: length 5.3, width 2.8 mm.]"

Distribution. Russia: Transbaikalia, Chitinskaya oblast, Nerchinsko-Zavodskoy district, Pavlovka village. Mesozoic: Early Cretaceous, Lower Neocomian, Gidarinyskaya formation.

Species:

† *ovalis* Kireichuk & Ponomarenko, 1990; Russia: Transbaikalia; Lower Cretaceous, Gidarinyskaya formation

Kireichuk, A. G. & Ponomarenko, A. G. 1990: 83. Ponomarenko, A. G. & Kireichuk, A. G. 2005–2008: http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm. Schmied, H. et al. 2009: 25

Superfamily Cucujoidea *incertae sedis*

† Genus *Palaeoendomychus* Zhang, 1992

http://species-id.net/wiki/Palaeoendomychus

Zhang, J.-F. 1992: 337 (Endomychidae).
[Type species: *Palaeoendomychus gymnus* Zhang, 1992]
Kolibáč, J. & Huang, D.-Y. 2008: 139 (Cucujoidea *incertae sedis*). Ponomarenko, A. G. & Kireichuk A. G. (2005–2008): http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm (Trogossitidae). Schmied, H. et al. 2009: 26.

Remarks. The author (Zhang 1992: 337) compares the genus with pantropical *Stenotarsus* Perty, 1832 which contains about 250 recent species that are highly variable in body shape. A combination of characters similar to those of *Palaeoendomychus* may be found, for example, in Endomychidae and Nitidulidae (Kolibáč and Huang 2008).

Original description. "*Body minute and compact, oval, hairless. Head deeply sunk into pronotum. Eyes rather large, widely separated, slightly prominent. Antennae short, flagellum cylindrical. Pronotum transverse, short* (Chin.: raised at centre), *without membrane* [sic] *in front, but with lateral sides* (Chin. "edges") *broadly flattened, posterior angles prominent. Scutellum small, narrowly triangular, distinctly longer than broad. Elytra wide, dehiscent, as wide at base as pronotum, and both closely connected to one another, humeral angles rounded, terminal angles prominent, surface with striae. Legs normal, with tarsi short and narrow* (Chin. 3 tarsomeres visible), *first and second tarsal segments triangular, each about as long as wide, third cylindrical, noticeably longer than wide.*" (Zhang 1992: 334, 337.) After Kolibáč and Huang (2008).

Note: The Chinese and English texts are somewhat different from one another. Important items from the Chinese are translated in parentheses.

Species:

† *gymnus* Zhang, 1992; China: Shandong; Mesozoic: Lower Cretaceous
Zhang, J.-F. 1992: 337 (Endomychidae). Kolibáč, J. 2006: 136 (Trogossitidae *incertae sedis*). Kolibáč, J. & Huang, D.-Y. 2008: 139 (Cucujoidea *incertae sedis*). Ponomarenko, A. G. & Kireichuk A. G. (2005–2008): http://zin.ru/animalia/Coleoptera/rus/paleosy2.htm (Trogossitidae). Schmied, H. et al. 2009: 26.

Family Salpingidae

Genus *Paralindria* Olliff, 1883 [Type species: *Paralindria bipartita* Olliff, 1883]

Olliff, S. 1883b: 57 ("... *be placed between* [Alindria] *and* Melambia."). Reitter, E. 1890: 264 ["*Paralindria* Oliff, 1883 = *Serrotibia* Reitt. (Stett. Ztg. 1877, 339)].
bipartita Olliff, 1883; Ecuador
Reitter, E. 1890: 264 ["*Paralindria bipartita* Oliff. = *Serrotibia bicolor* Reitt., 1. c. pag. 341"].

Note. The synonymy is widely accepted and the genus *Serrotibia* is classified within Salpingidae at present.

Family Chrysomelidae

Genus *Peltoschema* Reitter, 1880 [Type species: *Peltoschema filicorne* Reitter, 1880]

Reitter, E. 1880: 4 (Trogossitidae). Léveillé, A. 1910: 28 (Trogossitidae).

Note. The classification of the genus within Chrysomelidae has been well known for a long time, e.g. Daccordi (2003a, b), Daccordi and De Little (2003). Species of the genus are distributed in Australia.

Family Derodontidae

Genus *Peltastica* Mannerheim, 1852 [**Type species:** *Peltastica tuberculata* Mannerheim, 1852]

Léveillé, A. 1910: 28 (Trogossitidae). Reitter, E. 1876: 60 (Trogossitidae).
tuberculata Mannerheim, 1852; Alaska (AL)
Léveillé, A. 1910: 28 (Trogossitidae). Reitter, E. 1876: 60 (Trogossitidae).
amurensis Reitter, 1879; Siberia (AL)
Léveillé, A. 1910: 28 (Trogossitidae).
reitteri Lewis, 1884; Japan (AL)
Léveillé, A. 1910: 28 (Trogossitidae).

Note. The classification of the genus within Derodontidae has been well known for a long time.

Family Helotidae

Helota MacLeay, 1825; eastern Asia
Reitter, E. 1876: 5 (Trogositidae: subfamilia Helotidae; *sic*!).

Family Monotomidae

? *Nemozoma nigripenne* Reitter, 1876; Colombia (varA)
Léveillé, A. 1910: 6 (*Nemosoma* (subgen. *Monesoma*)). Reitter, E. 1876: 14 (*Nemozoma nigripennis*).
syn. *Thione championi* Sharp, 1899?
Lepesme, P. & Paulian, R. 1944: 138. According to their notes, they studied the holotype of *Nemosoma* (*Monesoma*) *nigripenne* Lév. [sic] and consider it "[...] *est d'apres le type, un Cucujidae et est identique a* Thione Championi *Sharp*". The matter may be unfamiliar to monotomid workers as I have found no remarks on this synonymy in the literature.

Genus *Shoguna* Lewis, 1889

Note. Albert Winkler listed the genus among Trogossitidae in his catalogue (1924–1932) and probably considered it a relative of *Nemozoma* (Winkler 1927). It is classified within Monotomidae at present.

Family Synteliidae

Genus *Syntelia* Westwood, 1864 [**Type species:** *Syntelia indica* Westwood, 1864] (genus originally described in Trogossitidae).

Reitter, E. 1876: 23 (Trogossitidae). Westwood, J. O. 1864: 11. (Trogossitidae).

davidis Fairmaire, 1889; China: Sichuan
histeroides Lewis, 1882; Russia: Far East, Japan
indica Westwood, 1864; Nepal, Northeast India
Reitter, E. 1876: 23 (Trogossitidae). Westwood, J. O. 1864: 11.
mexicana Westwood, 1864; Mexico: Oaxaca
Reitter, E. 1876: 23 (Trogossitidae). Westwood, J. O. 1864: 11.
westwoodi Salle, 1873; Mexico
Reitter, E. 1876: 23 (Trogossitidae).

Family Zopheridae

Genus *Holopleuridia* Reitter, 1876 [**Type species:** *Holopleuridia maculosa* Reitter, 1876]

Kolibáč, J. 2005: 87 (transferred to Tenebrionoidea). Léveillé, A. 1910: 27 (Trogossitidae). Reitter, E. 1876: 56 (Trogossitidae).

maculosa Reitter, 1876; "La Luzera" (Colombia?)
Reitter, E. 1876: 56 (Trogossitidae).

***Nematidium* Erichson, 1845 [Type species:** unknown]

tenuissima (Reitter, 1876); Colombia
Reitter, E. 1876: 16 (*sub* Trogossitidae: *Filumis* Reitter, 1876)

Phylogeny of the family Trogossitidae

Recently, several important studies have centred upon the phylogeny of Cucujiformia, including Cleroidea and Trogossitidae.

Beutel and Pollock (2000) analyzed 20 larval head characters in 22 taxa (8 cleroid, 10 cucujiform, 4 outgroup) and advocated the monophyly of Cleroidea, but pointed out the paraphyly of traditional Cucujoidea. Trogossitidae were represented by *Calitys* and *Temnoscheila*, which genera were found in a sister relationship (*Calitys* was perhaps meant by the authors to be a representative of Peltinae). However, the inclusion of *Phloiophilus* into the trogossitids, as is presented herein, would be considered paraphyletic (but not polyphyletic) according to this study.

Hunt et al. (2007) used an extensive molecular data set of dozens Coleoptera specimens. His Cleroidea are also monophyletic but with the inclusion of Byturidae/Biphyllidae as a sister group of *Phloiophilus*. Trogossitidae are paraphyletic in the final tree: Trogossitinae + ((Lophocaterinae + Peltinae) + rest of Cleroidea). On the other hand, the most parsimonious tree of all 1880 studied beetle genera based on two mitochondrial genes shows the following phylogeny: [(*Diplocoelus* + *Biphyllus*) + (*Byturus* + (*Phloiophilus* + *Priasilpha*))] + [((*Kolibacia* + *Temnoscheila* + *Nemozoma* + *Tenebroides*) + (*Ancyrona* + *Lophocateres* + *Grynocharis*)) + (*Peltis grossa* + *Peltis ferrugineum*)] + (Cleridae + Melyridae *sensu lato*). This means that Trogossitidae (minus *Phloiophilus*) are perfectly monophyletic in the tree. It is also notable that Lophocaterinae are a sister group of Trogossinae there. (Note: *Leperina* is used for *Kolibacia tibialis*, *Trogossita* for *Temnoscheila*, *Ostoma* for *Peltis ferrugineum* in the mentioned paper.)

The most recent system of Trogossitidae is based on my morphological studies of 2005 (adults) and 2006 (larvae). The most important result is a confirmation of both Crowson's ideas on the relationship of *Calitys* with Trogossitinae and *Protopeltis* with the *Rentonium*-group. On the other hand, his opinion about the relationship between the lophocaterins and the trogossitins is called in question. However, it is correct to say that larval characters actually connect the two groups while the majority of adult characters tend to defeat them in favour of a sister relationship of the lophocaterins and trogossitins. Both major clades were analyzed separately under equal weights and then with the use of successive reweighting (Kolibáč 2006).

I employed 31 traditional morphological characters (16 adult, 15 larval) for 15 taxa (8 cleroid, 6 cucujoid, 1 derodontoid) in the analysis of 2008. Five cucujoid families (minus Phloeostichidae: *Hymaea*) were found to be monophyletic as well as Cleroidea. The group of cucujoid families (Cerylonidae, Coccinelidae, Endomychidae, Cucujidae, Byturidae, Phloeostichidae) were found to be paraphyletic with regard to the monophyletic Cleroidea. Trogossitidae were also found to be paraphyletic in this analysis. However, *Phloiophilus* was placed within a branch composed of trogossitid representatives, probably as a sister group of *Thymalus*. In the following analysis, *Phloiophilus* was analysed together with 43 trogossitid genera (88 characters of which 56 were adult and 32 larval). A strict consensus tree of 48 equally parsimonious trees indicates a possible relation of *Phloiophilus* with Peltinae and justifies independent subfamilial status for Lophocaterinae (the tree is reproduced herein, Fig. 26). It must be pointed out that 32 of 48 trees supported a sister relationship between the lophocaterins and the peltins. Only 16 trees supported a relationship between the lophocaterins and the trogossitins. This is perfectly consistent with the results of Hunt et al. (2007) and Kolibáč (2006).

The most extensive modern paper on the beetle phylogeny based on morphological data is that by Lawrence et al. (2011). The authors used more than 500 characters and analyzed 366 genera of 165 beetle families. The final resulting tree is, in the section relevant to us, far different from that by Hunt et al. (2007) and it is beyond the scope of this contribution to analyze differences at superfamilial level. Trogossitidae are found to be paraphyletic (*Acalanthis* + *Temnoscheila*, *Eronyxa* + *Grynoma* are placed in separate branches), even polyphyletic because *Thymalus* is placed in a cluster together with *Lamingtonium* and the nitidulid families, while *Rentonellum* as a sister group of *Smicrips* together with *Laemophloeus* and *Propalticus* lie in a very distant part of the cladogram. *Phloiophilus* was not studied in the paper.

Bocáková et al. (2011) used *Peltis ferrugineum*, *Grynocharis oblonga* and *Temnoscheila japonica* among outgroups in their molecular phylogeny of Melyridae *sensu lato*. *Peltis* and *Grynocharis* again form a sister group while the position of *Temnoscheila* is paraphyletic with regard to the rest of Cleroidea.

A work by Gunter et al. (2013) focuses on the molecular phylogeny of Cleridae. However, a relatively large set of trogossitid representatives were also studied. The resulting tree is very interesting: *Phloiophilus* is included in the trogossitine cluster

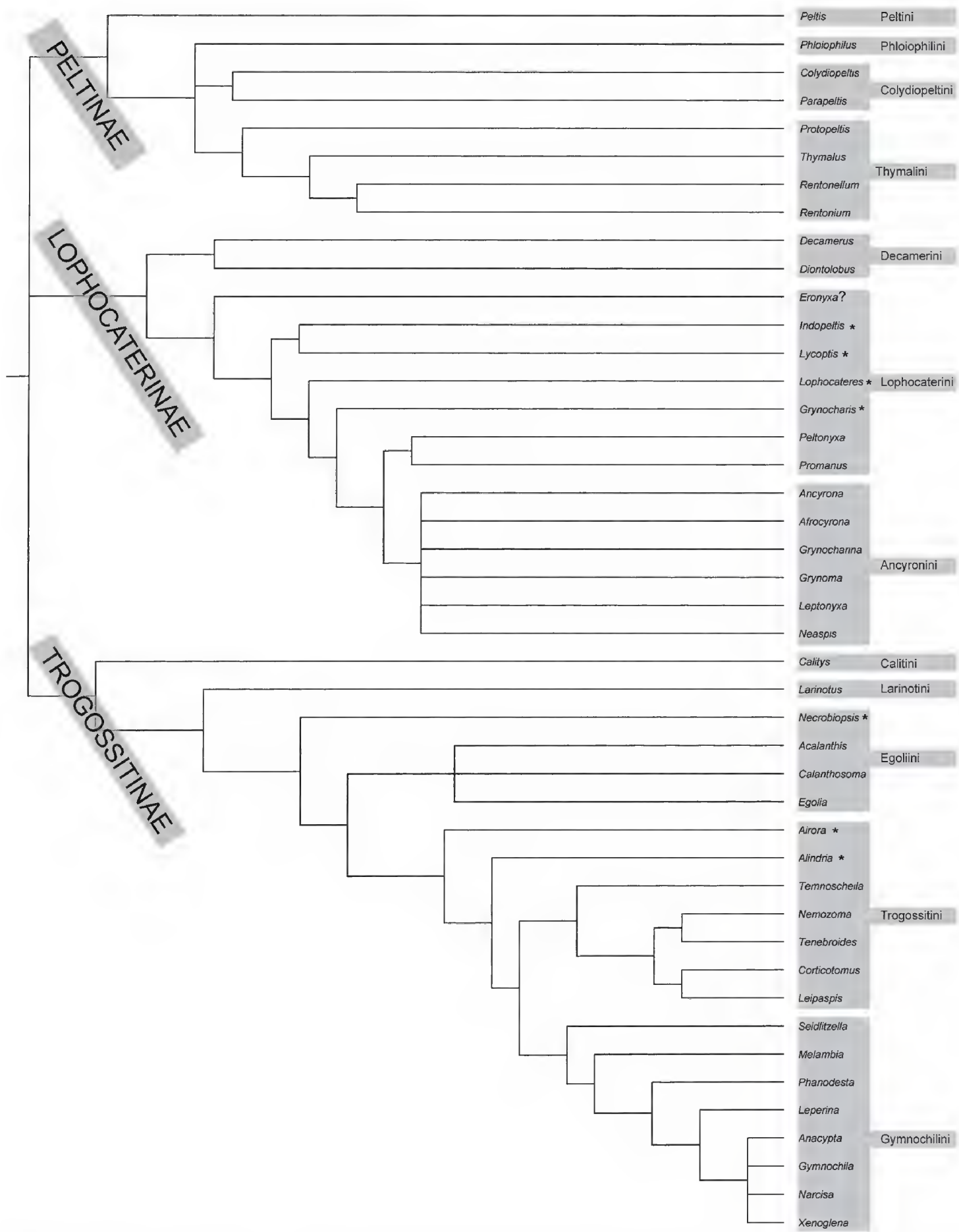


Figure 26. A phylogenetic tree of Trogossitidae adapted and modified from original drawing by Kolibáč (2008). Paraphyletic taxa denoted with the asterisk. Published with kind permission of Pro Entomologia, Basel, a publisher of Entomologica Basiliensia et Collectionis Frey.

between *Larinotus*, *Leperina* and *Temnoscheila* while *Rentonellum*, *Peltis*, *Grynocharis*, *Ancyrona* and *Neaspis* form a second cluster with a sister relationship to the rest of Cleroidea (similar to Hunt et al. 2007).

The most updated studies are those by the Tree of Life team and R. A. B. Leschen and co-authors, unpublished as yet. Their preliminary, mutually different, results were presented in the XXIVth International Congress of Entomology in Daegu (McKenna et al. 2012, Leschen et al. 2012).

Although the outcomes of the works above differ in details, major ideas may be summarized as follows:

1) The superfamily Cleroidea is a monophyletic group.
2) A part of the traditional Cucujoidea is probably paraphyletic with regard to Cleroidea. Cleroidea will probably, therefore, be extended to include several other "cucujoid" families.
3) Lophocaterinae probably constitutes a sister group to Peltinae.
4) Trogossitinae, as a basal group, may form a sister taxon to the major bulk of Cleroidea (although none of the molecular studies included the Metaxinidae-Chaetosomatidae-Thanerocleridae cluster, which might be in sister relationship with the trogossitines). This thesis, however, can hardly be justified by just the morphological evidence. If the subfamily Trogossitinae is actually confirmed paraphyletic, it should be classified at family rank again, as well as Peltidae composed of Peltinae and Lophocaterinae.
5) The exact position of *Phloiophilus* is uncertain; it is a basal group of Cleroidea, probably related to Trogossitidae *sensu lato*.

Acknowledgements

I am indebted to Ottó Merkl (Hungarian Natural History Museum, Budapest), Jean J. Menier and Nicole Berti (National Museum of Natural History, Paris), Jane Beard and Max Barclay (Natural History Museum, London), Lee Herman (American Museum of Natural History, New York), Ivan Löbl (Natural History Museum, Geneva), Josef Jelínek and Vladimír Švihla (National Museum, Prague) and many other curators for their generosity with time, help and hospitality.

I would also like to thank Petr Banař (Moravian Museum, Brno) for the SEM photographs (Figs 13–18), Alexey A. Zaitsev for the photo of the *Ancyrona* larva (Fig. 2G), and Jiří Ch. Vávra (Ostrava museum, Ostrava) who allowed me to take photos in his collection.

I am further obliged to Ivan Löbl (Geneva) and Rich Leschen (Auckland) for their critical notes on a draft of the manuscript.

As ever, I am grateful to Tony Long (Svinošice, Czech Republic) for working up the English.

This publication appears through financial support provided to the Moravian Museum by the Ministry of Culture of the Czech Republic, as part of its long-term conceptual development program for research institutions (ref. MK000094862).

References

Abbott I (1993) Review of the ecology and control of the introduced bark beetle Ips grandicollis (Eichhoff) (Coleoptera: Scolytidae) in Western Australia, 1952–1990. CALMScience 1(1): 35–46.

Alexander KNA (1997) The dead-wood beetles of Stourhead, including *Thymalus limbatus* (Fabricius) (Peltidae) new to Wiltshire. Coleopterist 4(3): 90.

Arbogast RT, Byrd RV (1982) The egg of the cadelle, *Tenebroides mauritanicus* (L.) (Coleoptera: Trogositidae): fine structure of the chorion. Entomological News 93(3): 61–66.

Arias E et al. (2009) A review of the Chilean Egoliini (Coleoptera: Trogossitidae) with description of a new species of Necrobiopsis Crowson. Zootaxa 2170: 37–45.

Audisio P, Gobbi G, Liberti G, Nardi G (1995) Coleoptera Polyphaga IX (Bostrichoidea, Cleroidea, Lymexyloidea). In: Minelli A, Ruffo S, La Posta S (Eds) Checklist delle specie della fauna italiana 54. Calderini, Bologna, 27 pp.

Baader EJ (1989) Pityogenes spp. (Col., Scolytidae): Untersuchungen uber verhaltenssteuernde Duftstoffe und deren Anwendung im Waldschutz. Journal of Applied Entomology 107(1): 1–31. doi: 10.1111/j.1439-0418.1989.tb00223.x

Bacianskas V (2009) Protected species of beetles (Coleoptera) found in Lithuania in 2004–2009. Rare for Lithuania Insect Species Records and Descriptions 21: 30–31.

Bahillo de la Puebla P, López-Colón JI (1999) Coleoptera: Fam. 37–38: Cleridae, Trogossitidae. In: Catalogus de la entomofauna aragonesa No. 20: 20 pp.

Bahillo de la Puebla P, López-Colón JI (2004) La familia Trogossitidae Latreille, 1802 en la Península Ibérica (Coleoptera, Cleroidea). Estudios del Museo de Ciencias Naturales de Álava 18–19: 127–152.

Baier P (1991) Zur Biologie des Borkenkäferraubers *Nemosoma elongatum* (L.) (Col.: Ostomidae). Zeitschrift fuer Angewandte Zoologie 78(4): 421–431. doi: 10.1111/j.1439-0418.1994.tb00706.x

Baier P (1994) Untersuchungen zur abundanzdynamischen Relevanz der Beifange von *Nemosoma elongatum* (L.) (Col., Ostomidae) in *Chalcoprax bekoderten* Flugbarrierefallen fur *Pityogenes chalcographus* (L.) (Col., Scolytidae). Journal of Applied Entomology 117(1): 51–57.

Barret RE (1932) New Coleoptera from California. Pan-Pacific Entomologist 8: 171–172.

Barron JR (1971) A revision of the Trogositidae of America North of Mexico (Coleoptera: Cleroidea). Memoirs of the Entomological Society of Canada 75: 1–143. doi: 10.4039/entm10375fv

Barron JR (1975) A review of the genus *Lycoptis* Casey (Coleoptera: Trogositidae). Canadian Entomologist 107: 1117–1122. doi: 10.4039/Ent1071117-10

Barron JR (1996) Review of Nearctic species of Ostoma (Coleoptera: Cleroidea, Trogositidae). Annals of the Entomological Society of America 89(2): 193–202.

Bashford R (1991) Wood-boring Coleoptera and associated insects reared from *Acacia dealbata* Link in Tasmania. Australian Entomological Magazine 18(3): 103–110.

Bashford R (1994) Life history and mortality of the longicorn *Epithora dorsalis* MacLeay (Coleoptera: Cerambycidae) in Tasmania. Australian Entomologist 21(4): 125–136.

Basilewsky P (1956) Contributions a l'étude de la faune entomologique du Ruanda-Urundi (Mission P. Basilewsky 1953). Coleoptera. Annales Museum Congo belge (Sér. 8), Sci. Zool. 51: 388–393.

Bercedo Paramo P, Arnaiz Ruiz L, Bahillo de la Puebla P, Lopez-Colon JI (2006) Record of the presence of *Thymalus limbatus* (Fabricius, 1797) in the autonomous region of Castilla y Leon (Coleoptera, Trogossitidae). Boletin de la SEA 39: 180.

Beutel RG, Pollock DA (2000) Larval head morphology of *Phycosecis litoralis* (Pascoe) (Coleoptera: Phycosecidae) with phylogenetic implications. Invertebrate Taxonomy 14: 825–835. doi: 10.1071/IT00030

Beutel RG, Ślipiński SA (2001) Comparative study of head structures of larvae of Sphindidae and Protocucujidae (Coleoptera: Cucujoidea). European Journal of Entomology 98: 219–232.

Billings RF, Cameron RS (1984) Kairomonal responses of Coleoptera, Monochamus titillator (Cerambycidae), *Thanasimus dubius* (Cleridae), and *Temnochila virescens* (Trogositidae), to behavioral chemicals of southern pine bark beetles (Coleoptera: Scolytidae). Environmental Entomology 13(6): 1542–1548.

Billings RF (1985) Southern pine bark beetles and associated insects. Effects of rapidly-released host volatiles on response to aggregation pheromones. Zeitschrift Für Angewandte Entomologie 99(5): 483–491.

Bocáková M, Constantin R, Bocák L (2011) Molecular phylogenetics of the melyrid lineage (Coleoptera: Cleroidea). Cladistics 27: 1–13.

Boone CKS, Diana LS, Kenneth FR (2008) The enemy of my enemy is still my enemy: competitors add to predator load of a tree-killing bark beetle. Agricultural and Forest Entomology 10(4): 411–421. doi: 10.1111/j.1461-9563.2008.00402.x

Boosten G (1983) Coléoptères de Belgique. 11. Bulletin and Annales de la Societe Royale Belge d'Entomologie 119(10–12): 290–293.

Borowiec L (1983) Zeszyt 69. Paweznikowate – Peltidae. In: Klucze do oznaczania owadów Polski. Czesc XIX. Panstwowe wydawnictwo naukowe, Warszawa-Wroclaw, 16 pp.

Bouchard P, Bousquet Y, Davies A, Alonso-Zarazaga M, Lawrence J, Lyal C, Newton A, Reid C, Schmitt M, Slipinski A, Smith A (2011) Family-group names in Coleoptera (Insecta). Zookeys 88: 1–972. doi: 10.3897/zookeys.88.807

Böving AG, Craighead FC (1931) An illustrated synopsis of the principal larval forms of the order Coleoptera. Entomologica Americana, 1–351. doi: 10.5962/bhl.title.6818

Brookes A (1932) A new genus and six new species of Coleoptera. Transactions and Proceedings of the New Zealand Institute 63: 25–33.

Broun T (1909) Notes on Coleoptera from the Chatham Islands. Transactions of the New Zealand Institute 41: 145–150.

Broun T (1915) Descriptions of new genera and species of Coleoptera. Bulletins of New Zealand Institute 1: 267–346.

Brustel H (2009) Antrodia spp. – polypore hosts of rare *Quilnus* spp. (Heteroptera Aradidae) and *Calitys scabra* (Coleoptera Trogositidae) and discovery of a high entomological site in the Pyrenees: the Rioumajou valley. Entomologiste 65(5): 227–232.

Burakowski B, Mroczkowski M, Stefanska J (1986) Chrzaszcze, Coleoptera. Dermestoidea, Bostrichoidea, Cleroidea, Lymexylonoidea. In: Katalog Fauny Polski. XXIII, tom 11. PWN Warszawa, 244 pp.

Carter HJ, Zeck EH (1937) A monograph of the Australian Colydiidae. Proceedings of Linnean Society of New South Wales 62: 181–208, pls 8, 9.

Casey TL (1890) Coleopterological notices. II. Annals of the New York Academy of Sciences 5: 307–504. doi: 10.1111/j.1749-6632.1890.tb57008.x

Casey TL (1916) Some random studies among the Clavicornia. Memoirs on the Coleoptera 7: 35–292.

Casey TL (1924) Addition to the known Coleoptera of North America. Memoirs on the Coleoptera 11: 1–347.

Chang T-C, Liu T-Y (1981) Insect pests of stored paddy in natural – ventilation and forced ventilation storehouses. National Science Council Monthly 9(2): 116–119.

Chûjô M, Lee CE (1994) Trogositidae, Languriidae, Tenebrionidae and Alleculidae from Korea (incl. Chejudo Is.) (Coleoptera). Esakia 34: 187–193.

Conrad R (1995) The second contribution to the beetle fauna of Thuringia (Insecta, Coleoptera). Thueringer Faunistische Abhandlungen 2: 190–195.

Costa C, Vanin SA, Casari-Chen SA (1988) Larvas de Coleoptera do Brasil. Museu de Zoologia, Universidade de Sao Paulo, 282 pp.+165 tabs.

Crowson RA (1955) The natural classification of the families of Coleoptera. Nathaniel Lloyd + Co., Ltd., London, 187 pp.

Crowson RA (1964a) A review of the classification of Cleroidea (Coleoptera), with descriptions of two genera of Peltidae and of several new larval types. Transaction of the Royal entomological Society of London 116: 275–327.

Crowson RA (1964b) The habits and life cycle of *Phloiophilus edwardsi* Steph. (Coleoptera: Phloiophilidae). Proceedings of the Royal entomological Society of London (A) 39: 151–152.

Crowson RA (1966) Further observations on Peltidae (Coleoptera: Cleroidea), with definitions of a new subfamily and of four new genera. Proceedings of the Royal entomological Society of London 35: 119–127.

Crowson RA (1967) The natural classification of the families of Coleoptera. Addenda et Corrigenda. Entomologist's Monthly Magazine 212: 209–214.

Crowson RA (1970) Further observations on Cleroidea (Coleoptera). Proceedings of the Royal entomological Society of London (B) 39: 1–20.

Crowson RA (1972) On the systematic value of the alimentary canal in Cleridae. Systematic Zoology 21: 339–340. doi: 10.2307/2412171

Cunev J (1999) Chrobáky (Coleoptera) Hornej Oravy (severné Slovensko). Acta Rerum naturalium Musei naturalis Slovakiae 45: 53–94.

Daccordi M, De Little DW (2003) New taxa of Chrysomelinae of Tasmania (Coleoptera Chrysomelidae: Chrysomelinae). Museo Regionale di Scienze Naturali Monografie (Turin) 35: 343–378.

Daccordi M (2003a) New species of Chrysomelinae from New South Wales (Coleoptera Chrysomelidae: Chrysomelinae). Museo Regionale di Scienze Naturali Monografie (Turin) 35: 379–412.

Daccordi M (2003b) New taxa of Chrysomelinae of Queensland (Coleoptera Chrysomelidae: Chrysomelinae). Museo Regionale di Scienze Naturali Monografie (Turin) 35: 413–460.

Dahlsten DL (2004) Attraction of Ips pini (Coleoptera: Scolytinae) and its predators to natural attractants and synthetic semiochemicals in northern California: Implications for population monitoring. Environmental Entomology 33(6): 1554–1561. doi: 10.1603/0046-225X-33.6.1554

Dejean PF MA (1835) Catalogue des coléoptères de la collection de M. le comte Dejean, Deuxième édn [Livraison 4]. Méquignon-Marvis Père et Fils, Paris.

Dajoz R (1991) Une espèce nouvelle de Cylidrella de Californie. Son intérêt écologique et biogéographique. Nouvelle Revue Entomologique (n.s.) 7: 245–250.

Dajoz R (1997) Description de *Corticotomus testaceus* n. sp. (Coleoptera Trogositidae) et notes sur trois espèces de l'Ouest des Etats-Unis. Bull. mens. Soc. linn. Lyon 66: 40–44.

Delobel A, Tran M (1993) Les Coléoptères des denrées alimentaires entreposées dans les régions chaudes. Faune Tropicale 32: 1–425.

DeMars CJ, Dahlstena DL, Sharpnacka NX, Rowneya DL (1986) Tree utilization and density of attacking and emerging populations of the western pine beetle (Coleoptera: Scolytidae) and its natural enemies, Bass Lake, California, 1970–1971. Canadian Entomologist 118(9): 881–900. doi: 10.4039/Ent118881-9

Dippel C (1991) Zur Biologie des Borkenkäferprädators *Nemosoma elongatum*. Naturwissenschaften 78(10): 473–474. doi: 10.1007/BF01134390

Dippel C (1995) Zur Bionomie des Borkenkäferantagonisten *Nemosoma elongatum* L. (Col., Ostomidae). Mitteilungen der Deutschen Gesellschaft fuer Allgemeine und Angewandte Entomologie 10(1–6): 67–70.

Dippel C (1996) Investigations on the life history of *Nemosoma elongatum* L. (Col., Ostomidae), a bark beetle predator. Journal of Applied Entomology 120(7): 391–395. doi: 10.1111/j.1439-0418.1996.tb01626.x

Dippel C, Heidger C, Nicolai V, Simon M (1997) The influence of four different predators on bark beetles in European forest ecosystems (Coleoptera: Scolytidae). Entomologia Generalis 21(3): 161–175.

Dominguez-Sanchez B et al. (2008) Kairomonal response of coleopterans associated with Dendroctonus frontalis and two Ips species (Coleoptera: Curculionidae) in forest of Chiapas, Mexico. Revista Mexicana de Biodiversidad 79(1): 175–183.

Dow RP (1912) A new variety of *Trogosita virescens*. Journal of New York Entomological Society 20: 70–71.

Downie NM, Arnett RH Jr (1996) The beetles of northeastern North America. Volume 2: Polyphaga: Series Bostrichiformia through Curculionoidea. Sandhill Crane Press, Gainesville, i–x, 891–1721.

Dziadik-Turner C, Kogaa D, Mai MS, Kramer KJ (1981) Purification and characterization of two [beta]-N-acetylhexosaminidases from the tobacco hornworm, *Manduca sexta* (L.) (Lepidoptera: Sphingidae). Archives of Biochemistry and Biophysics 212(2): 546–560. doi: 10.1016/0003-9861(81)90398-2

Endrödy-Younga S (1960) Neue Angaben zur Klärung des Systems der Familie Clambidae und Beschreibung einer neuen Liodiden-Gattung (Coleoptera). Annales historico-naturales Musei Nationalis Hungarici 52: 239–245.

Erber D, Wheater CP (1987) The Coleoptera of the Selvagem Islands, including a catalogue of the specimens in the Museu municipal do Funchal. Boletim do Museu Municipal do Funchal 39: 156–187.

Erichson WF (1842) Beitrag zur Insecten-Fauna von Vandiemensland, mit besonderer Berücksichtigung der geographischen Verbreitung der Insecten. Archiv für Naturgeschichte 8: 83–287, 2 pls.

Erichson WF (1844) Einige Nachträge su meinem Versuch einer systematischen Eintheilung der Nitidularien. Germar's Zeitschrift für die Entomologie 5: 438–458.

Esaki T et al. (1951) Iconographia Insectorum Japonicorum. Editio secunda reformata, Hokuryukan, Tokyo.

Fabricius JC (1801) Systema Eleutheratorum secundum ordines, genera, species, adjectis synonymis, locis, observationibus, descriptionibus. Vol. I. Bibliopolii Academici Novi, Kiliae.

Fairmaire L (1881) Coléopteres des iles Viti (Fidgi). Annales de la Société Entomologique de France Sér. 6, 1: 243–318.

Fall HC (1910) Miscellaneous notes and descriptions of North American Coleoptera. Transaction of the American entomological Society 36: 89–197.

Faustini DI, Halstead DGH (1982) Setiferous structures of male Coleoptera. Journal of Morphology 173: 43–72. doi: 10.1002/jmor.1051730106

Fettig CJ, Dabney CP (2006) Seasonal abundance of *Temnochila chlorodia* (Mannerheim) (Coleoptera: Trogositidae) collected in western pine beetle pheromone-baited traps in northern California. Journal of Entomological Science 41(1): 75–83.

Fettig CJ et al. (2004) Field response of Dendroctonus valens (Coleoptera: Scolytidae) and a major predator, *Temnochila chlorodia* (Coleoptera: Trogositidae), to host kairomones and a Dendroctonus spp. pheromone component. Journal of Entomological Science 39(4): 490–499.

Fettig CJ, Borys RR, Dabney CP, McKelvey SR, Cluck DR, Sherl L (2005) Disruption of red turpentine beetle attraction to baited traps by the addition of California fivespined ips pheromone components. Canadian Entomologist 137(6): 748–752. doi: 10.4039/n05-042

Fettig CJ, Borys RR, Dabney CP, McKelvey SR, Cluck DR, Smith SL (2007) The response of *Dendroctonus valens* and *Temnochila chlorodia* to Ips paraconfusus pheromone components and verbenone. Canadian Entomologist 139(1): 141–145. doi: 10.4039/n06-013

Fjellberg A, Hansen SO (1997) *Peltis grossa* (L.) – still present in Norway (Coleoptera, Trogositidae). Fauna Norvegica Series B 44(1): 77. doi: 10.4039/n06-013

Foster DE (1976) North American Thaneroclerinae larvae (Coleoptera: Cleridae). The Coleopterists Bulletin 30: 75–80.

Franz H (1981) Ein neuer *Thymalus* aus Tunesien, (Ostomidae, Col.). Koleopterologische Rundschau 55: 51–52.

Fursov NI (1930) Novyye vidy zhestkokrylykh, semeistva Ostomidae [New species of Coleoptera belonging to the genus *Nemosoma* (Ostomidae)]. Trudy Instituta Drevesiny (Leningrad) 1929: 181–183.

Gaylord MLW (2008) Influence of temperature on spring flight initiation for southwestern ponderosa pine bark beetles (Coleoptera: Curculionidae, Scolytinae). Environmental Entomology 37(1): 57–69. doi: 10.1603/0046-225X(2008)37[57:IOTOSF]2.0.CO;2

Ghose S, Haldar DP (1989) Role of environmental factors in the incidence of two new species of apicomplexan parasites, *Hirmocystis lophocateri* sp. n. and *Hirmocystis triboli* sp. n. from coleopteran insects. Acta Protozoologica 28(1): 49–60.

Ghosh S, Saha K (1992a) Experimental application of *Nosema* sp. on *Lophocateres pusillus* (K.) (Coleoptera: Curculionidae). Acta Protozoologica 31(3): 181–184.

Ghosh S, Saha K (1992b) Effects of *Nosema* sp. on the molting of a stored-grain pest *Lophocateres pusillus* (Coleoptera: Trogositidae). Environment and Ecology (Kalyani) 10(3): 613–617.

Ghosh S, Saha K (1995) Impact of temperature and relative humidity on the incidence of a microsporan parasite, *Nosema* sp. I, infecting coleopteran stored grain pest, *Lophocateres pusillus*. Journal of Entomological Research (New Delhi) 19(3): 207–214.

Gimmel M, Leschen RA B (in press) A new species of mycophagous *Rentonium* (Coleoptera: Cleroidea: Trogossitidae) based on larvae and adults, and a catalogue of Rentoniinae. Journal of Natural History.

Gobbi G (1983) Appunti su Coleotteri Cleroidei predatori di xilofagi (Coleoptera, Trogositidae, Cleridae, Melyridae). Bolletino Associazione Romana di Entomologia 38: 51–62.

Goheen DJ (1985) Visitation frequencies of some insect species on Ceratocystis wageneri infected and apparently healthy ponderosa pines. Canadian Entomologist 117(12): 1535–1543. doi: 10.4039/Ent1171535-12

Gollkowski V (1988) *Tenebrioides mauretanicus* L. und *T. fuscus* Goeze im Vogtland (Col., Ostomidae). Entomologische Nachrichten und Berichte 32(1): 42.

Gorham HS (1886) Insecta. Coleoptera. Malacodermata. Supplement. In: Godman FD, Salvin O (Eds) Biologica Centrali-Americana. Volume III. Part 2. London, Dulau, Co., B. Quaritsch, 313–372.

Gourves J (2006) Contribution to the study of Ostomidae from Morocco (Coleoptera). Contribution a l'etude des Ostomidae du Maroc (Coleoptera). Revue de l'Association Roussillonnaise d'Entomologie 15(2): 56–60.

Gray DW (2002) Field response of Ips paraconfusus, *Dendroctonus brevicomis*, and their predators to 2-methyl-3-buten-2-ol, a novel alcohol emitted by ponderosa pine. Journal of Chemical Ecology 28(8): 1583–1597. doi: 10.1023/A:1019924428970

Gray GR (1832) Notices of new genera and species. The Animal Kingdom Arranged in Conformity with its Organization; by the Baron Cuvier, Member of the Institute of France, &c. &c. &c, Vol.14, In: Griffith E (Ed) The Class Insecta Arranged by the Baron Cuvier, Vol. 1, Whittaker, Treacher, and Co., London, viii + 1–570.

Griffith E, Pidgeon E (1832) The Class Insecta Arranged by the Baron Cuvier, with Supplementary Additions to Each Order. And Notices of New Genera and Species by George Gray, Esq, Vol. 1. Whittaker, Treacher, and Co., London.

Grouvelle A (1913) H. Sauter's Formosa-Ausbeute (Rhysodidae, Nitidulidae, Ostomidae, Colydiidae, Passandridae, Cucujidae, Cryptophagidae, Diphyllidae, Lathridiidae, Mycetophagidae, Dermestidae). Archiv für Naturgeschite 79A: 33–73.

Gueorguiev G, Georgiev G, Mirchev M, Tsankov T (2003) Four new coleopteran species (Insecta: Coleoptera) for Bistrishko Branishte biosphere reserve in the Vitosha Mountain, Bulgaria. Acta Zoologica Bulgarica 55(1): 107–112.

Gunter NL, Leavengood JM Jr, Bartlett JS, Chapman EG, Cameron SL (2013) A molecular phylogeny of the checkered beetles and a description of Epiclininae a new subfamily (Coleoptera: Cleroidea: Cleridae). Systematic Entomology 38: 626–636. doi: 10.1111/syen.12019

Gürlich S, Suikat R, Ziegler W (1995) Katalog der Käfer Schleswig-Holsteins und des Niederelbegebietes. Verhandlungen des Vereins für naturwissenschaftliche Heimatforschung zu Hamburg 41: 1–111.

Hallan J (2007–2012) Biology Catalogue. Texas A&MUniversity. http://insects.tamu.edu/research/collection/hallan/test/Arthropoda/Insects/Coleoptera/Family/Trogossitidae.txt [Last updated: March 24, 2008, accessed November 2009]

Handlirsch A (1906–1908) Die fossilen Insekten und die Phylogenie der rezenten Formen. Ein Handbuch für Paläontologen und Zoologen. Engelmann, Leipzig, 1430 pp.

Hansen SO, Borgersen B (1991) *Calitys scabra* (Thunberg 1784) (Col., Trogositidae) rediscovered in Norway, new species for Vestfold. Fauna Norvegica Series B 38(1): 40.

Hatch MH (1962) The beetles of the Pacific Northwest. III: Pselaphidae and Diversicornia I. University of Washington Publications in Biology 16: iii–iii.

Hawkeswood TJ (1991) Notes on the biology of *Leperina cirrosa* Pascoe (Coleoptera: Trogossitidae). Victorian Entomologist 21(6): 159–161.

Hawkeswood TJ (1992) Observations on the biology of the Australian beetle *Leperina cirrosa* Pascoe (Coleoptera: Trogossitidae). Bulletin and Annales de la Societe Royale Belge d'Entomologie 128(7–9): 229–233.

Hayes JL, Johnson PL, Eglitis A, Scott DW, Spiegel L, Schmitt CL, Smith SE (2008) Response of bark and woodboring beetles to host volatiles and wounding on western juniper. Western Journal of Applied Forestry 23(4): 206–215.

Heer O (1862) Beitraege zur Insekenfauna Oeningens. Coleoptera-Geodephagen, Hydrocanthariden, Gyriniden, Brachelytren, Clavicornen, Lamellicornen und Buprestiden. Natuurkundige verhandelingen van de Hollandsche maatschappij der wetschappen te Haarlem 2: 1–90.

Herger P (1998) Record of *Tenebroides fuscus* (Goeze, 1777) in the high montane zones of the Napf area (Coleoptera, Trogositidae). Entomologische Berichte Luzern 39: 105–106.

Heuer H, Vite JP (1984a) Chalcogran: unique kairomone-governed predator-prey relations among ostomid and scolytid beetles. Naturwissenschaften 71(4): 214–215. doi: 10.1007/BF00490438

Heuer H, Vite JP (1984b) Prey spectrum of *Nemosoma elongatum* L. (Coleoptera: Ostomidae) governed by kairomone response. International Congress of Entomology Proceedings 17: 586.

Hieke F, Pietrzeniuk E (1984) Die Bernstein-Käfer des Museums fur Naturkunde, Berlin (Insecta, Coleoptera). Mitteilungen aus dem zoologischen Museum in Berlin 60: 297–326.

Hilszczanski J (2006) *Nemosoma caucasicum* Menetries, 1832 (Coleoptera: Trogossitidae) – nowy dla fauny Polski gatunek chrzaszcza. Wiadomoszczi entomologiczne 25: 29–32.

Holub A, Snizek M (1997) Faunistic record from the Czech Republic – 72. Coleoptera: Trogositidae. Klapalekiana 33(3–4): 150.

Holzer E (1995) Erstnachweise und Wiederfunde für die Käferfauna der Steiermark (Coleoptera). Mitteilungen der Abteilung für Zoologie am Landesmuseum Joanneum in Graz 49: 23–47.

Hope FW (1840) The coleopterist's manual, part the third, containing various families, genera, and species, of beetles, recorded by Linneus and Fabricius. Also, descriptions of newly discovered and unpublished insects. Bridgewater, Bowdery, Kerby, London, 191pp, 3pls.

Huber C, Kobel E (1994) Zum Vorkommen von *Tenebroides fuscus* (Goeze, 1777) in der Schweiz (Coleoptera, Trogositidae). Mitteilungen der Schweizerischen Entomologischen Gesellschaft 67(1–2): 1–5.

Hunt T, Bergsten J, Levkanicova Z, Papadopoulou A, St.John O, Wild R, Hammond PM, Ahrens D, Balke M, Caterino MS, Gomez-Zurita J, Ribera I, Barraclough TG, Bocakova M, Bocak L, Vogler AP (2007) A Comprehensive Phylogeny of Beetles Reveals the Evolutionary Origins of a Superradiation. Science 318: 1913–1916. doi: 10.1126/science.1146954

Iablokoff-Khnzorian SM (1975) Bemerkungen über paläarktische Buntkäfer (Coleoptera, Cleridae). Entomol. Blätter 71: 141–148.

Illiger JK W (1807) Zusätze, Berichtigungen und Bemerkungen zu Fabricii Systema Eleutheratorum. Magazin für Insektenkunde 6: 296–317.

Inouye M, Nobuchi A (1957) Studies on the natural enemies of the bark beetles and borers. Scientific Reports of the Hokkaido Forestry Experimental Station 8: 190–204. [in Japanese, English summary]

Jakobson GG (1915) Zhuki Rossii i Zapadnoy Evropy. Rukovodstvo k opredeleniu zhukov. Vypusk 11. AF Devrjen, St.-Peterbourg, 865–1024.

Kampsu G (2005) Studies on the biology and distribution of cadelle, *Tenebroides mauritanicus* (L.) (Coleoptera: Trogossitidae) in Bursa, Turkey. Journal of Entomology 2(1): 17–20. doi: 10.3923/je.2005.17.20

Karalius S, Monsevicius V (1992) 34 new and 3 rare for Lithuania species of Coleoptera found in 1973–1991. In: Jonaitis V (Ed) New and rare for Lithuania insect species: records and descriptions of 1992. Institue of Ecology, Vilnius, 5–11.

Kiesenwetter EAH von (1863) Naturgeschichte der Insecten Deutschland. Erste Abtheilung. Coleoptera. Vierter Band. Nicolaische Verlagsbuchhandlung, Berlin, vi+746pp.

Kirby W (1837) The Insects. In: Richardson J (Ed) Fauna Boreali-Americana, or the Zoology of the Northern Parts of British America, ... Part 4. JFletcher, Norwich, 325 pp. + 8 pls.

Kireichuk AG, Ponomarenko AG (1990) Iskopaemye zhuki semeistv Peltidae i Nitidulidae (Coleoptera). Paleontologicheskii zhurnal 1990: 78–88 + Tab. VII.

Klausnitzer B (1976) Über die Larven der Ostomidae (Col.). Entomologische Nachrichten, Dresden 20: 4–9.

Klausnitzer B (1978) Melyridae, Cleridae, Ostomidae. In: Ordnung Coleoptera (Larven). Akademie Verlag, Berlin, 378 pp: 123–6,127–130,173–8.

Klausnitzer B (1996) 60–64. Familie. Trogositidae, Peltidae, Phloiophilidae, Lophocateridae, Cleridae. In: Klausnitzer B (Ed) Die Larven der Käfer Mitteleuropas. Band 3. Goecke, Evers, Krefeld. Im Gustav Fischer Verlag, Jena, Stuttgart, 144–187.

Klimaszewski J, Watt JC (1997) Coleoptera: family group review and keys to identification. Fauna of New Zealand 37: 1–199.

Kobayashi K (1980) The Insecta impaled by the bull-headed shrike Lanius bucephalus bucephalus (Temmink and Schulegel) and the weekly variation of the number of impaled prey. Gensei 37: 1–6.

Koch K (1993) Dritter Nachtrag zur Käferfauna der Rheinprovinz. Teil 3: Ostomidae – Scolytidae. Decheniana 146: 203–271.

Kohnle U, Vite JP (1984) Bark beetle predators: strategies in the olfactory perception of prey species by clerid and trogositid beetles. Zeitschrift für angewandte Entomologie 98(5): 504–508.

Kolibáč J (1987) Morphological comparison of type (or model) genera of the subfamilies od Cleridae (Coleoptera, Cleridae). Mitteilungen der Münchner Entomologischen Gesellschaft 77: 103–135.

Kolibáč J (1993a) Observations on Ancyrona Reitter, 1876, with a key to Central European Trogositidae (Coleoptera, Trogositidae). Nachrichtenblatt der bayerischen Entomologen 42: 16–22.

Kolibáč J (1993b) Phloiophilidae. Trogositidae. Cleridae. In: Jelínek J et al. (1993) Check-list of Czechoslovak Insects IV (Coleoptera). (Seznam československých brouků). Folia Heyrovskyana Supplementum 1 (Praha), 89–90.

Kolibáč J (1996) Coleoptera: Cleroidea 1 (Phloiophilidae, Trogositidae and Cleridae). In: Rozkošný R, Vaňhara J (Eds) Terrestrial Invertebrates of the Pálava Biosphere Reserve of UNESCO, III. Folia Facultatis Scienciarium Naturalium Universitatis Masarykianae Brunensis, Biologia 94: 471–474.

Kolibáč J (1999) Comparative morphology of mandible, epipharynx and alimentary canal in larval and adult Cleroidea (Coleoptera). Acta Musei Moraviae, Scientiae biologicae 84: 11–69.

Kolibáč J (2002) Description of a larva of *Thymalus limbatus* (Fabricius, 1787) (Coleoptera, Trogositidae). Acta Musei Moraviae, Scientiae biologicae 87: 55–59.

Kolibáč J (2003) Trogositidae. In: Fauna Europaea. http://www.faunaeur.org

Kolibáč J (2004) Metaxinidae fam.nov., a new family of Cleroidea (Coleoptera). Entomologica Basiliensia 26: 239–268.

Kolibáč J (2005) A review of the Trogositidae. Part 1: Morphology of the genera (Coleoptera, Cleroidea). Entomologica Basiliensia et Collectionis Frey 27: 39–159.

Kolibáč J (2006) A review of the Trogossitidae. Part 2: Larval morphology, phylogeny and taxonomy (Coleoptera, Cleroidea). Entomologica Basiliensia et Collectionis Frey 28: 105–153.

Kolibáč J (2007a) Trogossitidae. In: Löbl I, Smetana A (Eds) Catalogue of Palaearctic Coleoptera. Vol. 4. Apollo Books, Stenstrup, 364–366.

Kolibáč J (2007b) Further observations on the tribe Ancyronini Kolibáč, 2006 (Coleoptera, Trogossitidae, Peltinae). Entomologica Basiliensia et Collectionis Frey 29: 53–76.

Kolibáč J (2008) Morphology, taxonomy and phylogeny of *Phloiophilus edwardsi* Stephens, 1830 (Coleoptera, Cleroidea). Entomologica Basiliensia et Collectionis Frey 30: 105–133.

Kolibáč J (2009) Some nomenclatorial notes on the family Trogossitidae (Coleoptera, Cleroidea). Entomologica Basiliensia et Collectionis Frey 31: 127–129.

Kolibáč J (2010) *Trichocateres fasciculifer*, a new genus and species of Trogossitidae: Lophocaterini (Coleoptera). Zootaxa 2353: 34–42.

Kolibáč J (2011) *Promanodes alleni* sp. n., the second species of the Tertiary genus *Promanodes* Kolibáč, Schmied, Wappler et Kubisz, 2010, with improved diagnosis of the genus and remarks on its phylogeny (Coleoptera: Trogossitidae). Zootaxa 2928: 57–63.

Kolibáč J, Huang D-Y (2008) Taxonomic status of the Mesozoic genera *Anhuistoma* Lin, 1985, Eotenebroides Ren, 1995, *Lithostoma* Martynov, 1926, *Palaeoendomychus* Zhang, 1992

and Sinosoronia Zhang, 1992 (Coleoptera). Entomologica Basiliensia et Collectionis Frey 30: 135–148.

Kolibáč J, Leschen RAB (2010) Trogossitidae Fabricius, 1801. In: Leschen R, Beutel RG, Lawrence JF (Eds) Handbuch der Zoologie/Handbook of Zoology. Band 4: Arthropoda, 2. Halfte: Insecta. Part 39: Coleoptera, Beetles Vol. 2. W. de Gruyter, Berlin-New York, 241–247.

Kolibáč J, Majer K, Švihla V (2005) Cleroidea. Brouci nadčeledi Cleroidea Česka, Slovenska a sousedních oblastí. Beetles of the superfamily Cleroidea in the Czech and Slovak republics and neighbouring areas. Clarion, Praha, 186 pp.

Kolibáč J, Schmied H, Wappler T, Kubisz D (2010) A description of *Promanodes* serafini gen. et sp. n. from Baltic amber, with a review of related New Zealand Promanus Sharp, 1877 (Coleoptera: Trogossitidae). Zootaxa 2620: 29–44.

Kolibáč J, Zaitsev AA (2010) A description of a larva of Ancyrona diversa Pic, 1921 and its phylogenetic implications (Coleoptera: Trogossitidae). Zootaxa 2451: 53–62.

Kryzhanovskij OL (1965) 38. Fam. Ostomatidae (Trogositidae) – Schitovidki. In: Gurjeva EL, Kryzhanovskii OL (Eds) The Insects of the European Part of USSR, Volume II: Beetles and Strepsiptera. Nauka, Moscow, Leningrad, 239–240. [in Russian]

Kukalová-Peck J, Lawrence JF (1993) Evolution of the hind wing in Coleoptera. Canadian Entomologist 125: 181–258. doi: 10.4039/Ent125181-2

Kuschel G (1990) Beetles in a Suburban Environment: ANew Zealand AQ20 Case Study. The Identity and Status of Coleoptera in the Natural and Modified Habitats of Lynfield, Auckland (1974–1989). DSIRPlant Protection Report 3.

Lacordaire Z (1857) Fam. 41: Clérides. In: Histoire Naturelle des Insectes. – Genera des Coléoptères IV. Paris, 493 pp.

Lafer GSh (1992) Peltidae (Lophocateridae). In: Keys to the identification of insects of the Soviet Far East. 3 – Coleoptera, or beetles. Part 2. Nauka, Saint-Petersburg, 82–86.

Larsson SG (1978) Baltic Amber – a Palaeobiological Study. Entomonograph Vol. 1. Scandinavian Science Press, Ltd. Klampenborg, Denmark, 192 pp.

Latreille PA (1802) Histoire Naturelle, Générale et Particuliere des Crustacés et Insectes. Tom troisieme: 133. (x+467pp+1).

Latreille PA (1806) Genera crustaceorum et insectorum secundum ordinem naturalem in familias disposita, iconibus exemplisque plurimus explicata. Tomus primus. Parisiis et Argentorati, Amand König, xvii+302pp, xvi pls.

Lawrence JF, Newton AF Jr (1982) Evolution and classification of beetles. Annual Review of Ecology and Systematics 13: 261–290. doi: 10.1146/annurev.es.13.110182.001401

Lawrence JF, Newton AF Jr (1995) Families and subfamilies of Coleoptera (with selected genera, notes, references and data on family-group names). In: Pakaluk J, Ślipiński SA (Eds) Biology, Phylogeny, and Classification of Coleoptera. Papers Celebrating the 80th Birthday of Roy A. Crowson. Muzeum i Instytut Zoologii PAN, Warszawa, 779–1006.

Lawrence JF, Britton EB (1994) Australian beetles. Melbourne University Press, 192 pp. doi: 10.1111/j.1440-6055.1980.tb00989.x

Lawrence JF (1980) A new genus of indo-australian Gempylodini with notes on the constitution of the Colydiidae (Coleoptera). Journal of Australian entomological Society 19: 293–310.

Lawrence JF (1982) Coleoptera. In: Synopsis and Classification of Living Organisms. McGraw-Hill Book Company, Inc., 482–553.

Lawrence JF (1991) Order Coleoptera. In: Stehr FW (Ed) Immature Insects. Vol. 2. Kendall/Hunt Publishing Company, Dubuque, Iowa, 144–237.

Lawrence JF, Hastings A, Dallwitz M, Paine T (1993) Beetle larvae of the world. In: Lawrence JF, Hastings A, Dallwitz M, Paine T (Eds) CSIRO Publications, CD-ROM, ISBN 0-643-05506.

Lawrence JF, Hastings AM, Dallwitz MJ, Paine TA, Zurcher EJ (1999a) Beetles of the World: A key and information system for families and subfamilies. CD-ROM, Version 1.0 for MS-Windows, CSIRO Publishing, Melbourne.

Lawrence JF, Hastings AM, Dallwitz MJ, Paine TA, Zurcher EJ (1999b) Beetle larvae of the world: Descriptions, illustrations, identification, and information retrieval for families and sub-families. CD-ROM, Version 1.1 for MS-Windows, CSIRO Publishing, Melbourne.

Lawrence JF, Ślipiński A (2013) *Globorentonium*, a new genus of rentoniine Trogossitidae (Coleoptera: Cleroidea) from Australia and Brazil. Zootaxa 3710(3): 257–270. doi: 10.11646/zootaxa.3710.3.4

Lawrence JF, Ślipiński A, Seago SE, Thayer MK, Newton AF, Marvaldi AE (2011) Phylogeny of the Coleoptera based on morphological characters of adults and larvae. Annales Zoologici 61: 1–217. doi: 10.3161/000345411X576725

Lawson SA, Morgan FD (1992) Rearing of two predators, *Thanasimus dubius* and *Temnochila virescens*, for the biological control of Ips grandicollis in Australia. Entomologia Experimentalis et Applicata 65(3): 225–233. doi: 10.1111/j.1570-7458.1992.tb00675.x

Lawson SA, Morgan FD (1993) Prey specificity of adult *Temnochila virescens* F. (Col., Trogositidae), a predator of Ips grandicollis Eichh. (Col., Scolytidae). Journal of Applied Entomology 115(2): 139–144. doi: 10.1111/j.1439-0418.1993.tb00373.x

Lemdahl G (2001) Records of *Grynocharis oblonga* L. (Coleoptera) on pine (*Pinus sylvestris*). Fynd av avlang flatbagge *Grynocharis oblonga* L. (Coleoptera) pa tall. Entomologisk Tidskrift 122(1–2): 39–40.

Leng CW (1920) Catalogue of the Coleoptera of America, north of Mexico. Mount Vernon, N. Y. 470 pp.

Lepesme P, Paulian R (1944) Les *Nemosoma* et genres voisins. Revue francaise d'Entomologie 10: 136–141.

Leschen RAB (2000) Beetles feeding on bugs (Coleoptera, Hemiptera): repeated shifts from mycophagous ancestors. Invertebrate Taxonomy 14: 917–929. doi: 10.1071/IT00025

Leschen RAB (2002) 72. Trogossitidae Latreille, 1802. In: Arnett RH, Thomas MC, Skelley PE, Frank JH (Eds) American Beetles. Vol. 2. Polyphaga: Scarabaeoidea through Curculionoidea. CRCPress, Boka Raton-London-New York-Washington D.C., 263–266.

Leschen RAB, Lackner T (2013) Gondwanan Gymnochilini (Coleoptera: Trogossitidae): generic concepts, review of New Zealand species and long-range Pacific dispersal. Systematic Entomology 38: 278–304. doi: 10.1111/j.1365-3113.2012.00661.x

Leschen RAB, Lawrence JF, Ślipiński AS, Gimmel M (2012) Phylogenetic relationships of Cleroidea. XXIVth International Congress of Entomology, August 19–25, 2012, Daegu, Korea.

Léveillé A (1877) Description d'une nouvelle espèce de trogositidae. Bulletin de la Société entomologique de France 1877: cxi–cxii.

Léveillé A (1888) Catalogue de la famille des Temnochilides. Annales de la Société entomologique de France Sér. 6, 8: 29–448.

Léveillé A (1910) Temnochilidae. In: Schenkling S (Ed) Coleopterorum Catalogus 11, W. Junk, Berlin, 40 pp.

Lin Q-B (1985) Insect fossils from the Hanshan formation at Hanshan county, Anhui province. Acta entomologica sinica 24: 300–311, 2 pls.

Löbl I, Smetana A (Eds) (2010) Catalogue of palaearctic Coleoptera. Vol. 6: Chrysomeloidea. 924 pp.

Lohse GA (1979) 30. Familie: Melyridae, 3. U.Fam. (Familie 30a): Phloeophilinae. In: Freude H, Harde KW, Lohse GA (Eds) Die Käfer Mitteleuropas. Band 6. Goecke, Evers, Krefeld, 83.

Lucht W (1981) Coleoptera Westfalica: Familia Trogositidae. Abhandlungen aus dem Landesmuseum für Naturkunde zu Muenster 43(3): 35–42.

Lucht W (1998) Supplements and amendments to the volumes 6, 7, 8 and 13 (Supplement 2). Family Trogossitidae, Peltidae, Lophocateridae, Lymexylidae. Erganzungen und Berichtigungen zu den Banden 6, 7, 8 und 13 (2. Supplement). Familie Trogositidae [Trogossitidae], Peltidae, Lophocateridae, Lymexylidae. In: Die Käfer Mitteleuropas. Bd. 15: 4. Supplementband. [The beetles of Central Europe. Vol. 15: 4. Supplement]. Goecke, Evers, Krefeld, 398 pp.

Luna de Carvalho E (1979) Guia pratico para a identificacao de alguns insectos de armazens e produtos armazenados. 2.a Parte. Junta de Investigacoes Cientifica do Ultramar, Lisbon, 73–191.

Machado A, Oromí P (2000) Elenco de los Coleoptéros de las Islas Canarias. [Catalogue of the Coleoptera of the Canary Islands.] Instituto de estudios Canarios, La Laguna.

Majer K (1986) Komentovaný katalog československých druhů čeledi Phloiophilidae a Melyridae (excl. Malachiinae). (Coleoptera, Cleroidea). Zborník Slovenského národního Múzea, Prírodné Vedy 32: 113–129.

Majer K (1994) A review of the classification of the Melyridae and related families (Coleoptera, Cleroidea). Entomologica Basiliensia 17: 319–390.

Mamaev BM (1976) Review of larvae of the family Trogossitidae (Coleoptera) in the fauna of the USSR. Zoologicheskiy Zhurnal 55: 1648–1658.

Marsden MA, Kline LN, Furniss MM (1981) Modeling seasonal abundance of Douglas-fir beetle in relation to entomophagous insects and location in trees. US Forest Service General Technical Report INT 111: 1–22.

Martynov AV (1926) KPoznaniyu Iskopaemykh Nasekomykh Yurskikh Slantsev Turkestana. 5. ONekotorykh Formakh Zhukov (Coleoptera). Ann. Soc. Paléont. Russie [Ezhegodnik Russkogo Paleontologicheskogo Obshchestva] 5: 1–39.

Massey CL, Lucht DD, Schmid JM (1977) Roundheaded pine beetle. US forest service forest insect and disease leaflet 155: 1–8.

Mateu J (1972) Les Insectes xylophages des Acacia dans les régions sahariennes. In: Publicacoes do Instituto de Zoologia "Dr.Augusto Nobre", Imprensa Portuguesa, Porto, 714 pp.

Matthews EG (1992) A guide to the genera of beetles of South Australia. Part 6 Polyphaga: Lymexyloidea, Cleroidea and Cucujoidea. In: Thurmer J (Ed) Special Educational Bulletin Series (No 9), South Australian Museum, Adelaide, 75 pp.

Mayor A (2007) Phloiophilidae. In: Löbl I, Smetana A (Eds) Catalogue of Palaearctic Coleoptera. Vol. 4. Apollo Books, Stenstrup, 363–364.

McCravy KW, Nowak JT, Douce GK, Berisford CW (2000) Evaluation of multiple-funnel and slot traps for collection of southern pine bark beetles and predators. Journal of Entomological Science 35(1): 77–82.

McKenna DD, Wild A, Kanda K, Maddison D, Farrell BD (2012) Reconstructing the Beetle Tree of Life. XXIVth International Congress of Entomology, August 19–25, 2012, Daegu, Korea.

Medvedev LN (1969) Novye mezozoyskiye zhestkokrylye (Cucujoidea) Azii. Paleontologicheskiy Zhurnal 1969: 119–125.

Merkl O (1993) Beetles with various antennae. 6. Diversicornaria 6. Clavicornia 1. Magyarorszag Allatvilaga 169: 1–27.

Meunier F (1921) Die Insectenreste aus den Lutetien von Messel bei Darmstadt. Abhandlungen der Hessischen Geologischen Landesanstalt 7: 1–16.

Milkowski M, Wojas T (2008) Two new localities of *Nemosoma caucasicum* Menetr. (Coleoptera: Trogossitidae) in Poland. Wiadomosci Entomologiczne 27(3): 172.

Miller DR, Gibson KE, Raffa KF, Seybold SJ, Teale SA, Wood DL (1997) Geographic variation in response of pine engraver, Ips pini, and associated species to pheromone, lanierone. Journal of Chemical Ecology 23(8): 2013–2031. doi: 10.1023/B:JOEC.0000006486.39056.48

Mitter H (1983) Die Verbreitung der Familie Ostomidae in Oberösterreich (Coleoptera, Ostomidae). Nachrichtenblatt der Bayerischen Entomologen 32(2): 52–54.

Mitter H (1998) Notizen zur Biologie und Verbreitung der Ostomidae in Oberösterreich (Coleoptera, Ostomidae). Stapfia 55: 559–565.

Miyatake M (1977) A new genus of the subfamily Thaneroclerinae from Fiji (Coleoptera: Cleridae). Transactions of Shikoku Entomological Society 13: 105–107.

Miyatake M (1985) Trogossitidae. In: Kurosawa Y, Hisamatsu S, Sasaji H (Eds) The Coleoptera of Japan in Color, 3. Hoikusha, Osaka, 147–150, pl. 24. [in Japanese]

Moragues G (1981) Nouvelle capture de *Nemosoma cornutum* en France (Col. Ostomatidae). Entomologiste (Paris) 37(6): 262–263.

Mörs T (1995) Die Sedimentationsgeschichte der Fossillagerstätte Rott und ihre Alterseinstufung anhand neuer Säugetierfunde (Oberoligozän, Rheinland). Courier Forschungsinstitut Senckenberg 187: 1–129.

Müller OF (1764) Hafniae et Lipsiae, F. Gleditschi. Fauna insectorum Fridrichsdalina, sive methodica descriptio insectorum agri Fridrichsdalensis cum characteribus genericis et specificis, nominibus trivialibus, locis natulibus, iconibus allegatis, novisque pluribus speciebus additis, xxiv + 96pp.

Nakane T (1963) Cleroidea. Trogossitidae. Fragmenta Coleopterologica 12: 46.

Nakane T (1985) New or little-known Coleoptera from Japan and its adjacent regions. XXXVIII. Fragmenta Coleopterologica 38–40: 153–164.

Nakane T, Ohbayashi K, Nomura S, Kurosawa Y (1963) Cleroidea. In: Iconographia Insectorum Japonicorum Colore naturali edita. Vol.II (Coleoptera). Hokuryukan, Tokyo, Japan, 181–186.

Nikitsky NB (1974) Morphology of larvae and mode of life of *Nemosoma* (Coleoptera, Trogossitidae), predator of bark beetles in the Nort-west Caucasus. Zoologicheskiy Zhurnal 53: 563–566.

Nikitsky NB (1980) Insect predators of bark beetles and their ecology. Nauka, Moscow, 237 pp.

Nikitsky NB (1992) Trogositidae. In: Ler PA (Ed) Opredelitel nasekomykh Dalnego Vostoka SSSR. Tom III. Zhestkokrylye, ili zhuki. [Keys to the identification of insects of the Soviet Far East. 3 – Coleoptera, or beetles. Part 2.] Nauka, Saint-Petersburg, 79–81.

Nikitsky NB, Semenov VB, Dolgin MM (1998) The beetles of the Prioksko-Terrasny Biosphere Reserve – xylobiontes, mycetobiontes, and Scarabaeidae (with the review of the Moscow Region fauna of these groups). Supplement 1. (With remarks on nomenclature and systematics of some Melandryidae of the World fauna). Sbornik Trudov Zoologicheskogo Muzeya MGU 36: 1–60.

Nikitsky NB, Semenov VB (2001) To the knowledge of the beetles (Coleoptera) of the Moscow region. Byulleten' Moskovskogo Obshchestva Ispytatelei Prirody Otdel Biologicheskii 106(4): 38–49.

Nilsson SG (1997) *Grynocharis oblonga* L. (Coleoptera: Trogositidae) – a specialized wood beetle with a relict distribution. Entomologisk Tidskrift 118(1): 1–9.

Noreika N (2009) New records of rare species of Coleoptera found in Ukmerge district in 2004–2005. New and Rare for Lithuania Insect Species Records and Descriptions 21: 68–71.

Olliff AS (1883a) Descriptions of new species of Clavicorn Coleoptera. Cistula Entomologica 3: 58–59.

Olliff AS (1883b) Descriptions of two larvae and new genera and species of Clavicorn Coleoptera, and a synopsis of the genus *Helota*, MacLeay. Cistula entomologica (Pars xxvii): p. 57 + Pl. 11, Fig. 6.

Olliff AS (1883c) Remarks on a small collection of Clavicorn Coleoptera from Borneo, with descriptions of new species. Transactions of the Entomological Society of London 1883: 173–186.

Page JM (1981) Drought-accelerated parasitism of conifers in the mountain ranges of northern California. Environmental Conservation 8(3): 217–226. doi: 10.1017/S0376892900027661

Pajares JA, Ibeas F, Díez JJ, Gallego D (2004) Attractive responses by *Monochamus galloprovincialis* (Col., Cerambycidae) to host and bark beetle semiochemicals. Journal of Applied Entomology 128(9–10): 633–638.

Pankow W (2010) *Nemozoma caucasicum* Menetries, 1832 (Coleoptera, Trogositidae) new in Germany. Mitteilungen Entomologischer Verein Stuttgart 45(2): 87.

Pascoe FP (1863) Notices of new or little-known genera and species of Coleoptera. Part IV. The Journal of Entomology 2: 26–56, pls II, III.

Pascoe FP (1868) Contributions to a knowledge of the Coleoptera. Part I (a paper read February 17, 1968, by Mr. F. P. Pascoe, with brief diagnoses of some of the most interesting of the new genera and species). The Proceedings of the Entomological Society of London 1868: xi–xiii.

Pascoe FP (1872) Notes on Coleoptera, with descriptions of new genera and species. Part II. Annals and magazine of natural history 4: 317–326, pl. xv. doi: 10.1080/00222937208696709

Paulian R (1998) Les insectes de Tahiti. [The insects of Tahiti.] Editions Boubee, Paris, 1–332.

Peris D, Kolibáč J, Delclòs X (in press) *Cretamerus vulloi* gen. et sp. n., the oldest bark-gnawing beetle (Coleoptera: Trogossitidae) from the Cretaceous amber. Journal of Systematic Palaeontology. [accepted Sept. 9, 2013]

Peyerimhoff PM de (1918) Nouveaux Coléopteres du Nord-Africain (Vingt-sixieme note): Faune du Cedre et du Sapin de Numidie Bulletin de la Société entomologique de France (Séance du 28 novembre 1917) 1917: 329–330.

Pic M (1921) Notes diverses, descriptions et diagnoses. L'Échange, Revue Linnéenne 37: 1–4.

Pic M (1924) Coleoptera-Clavicornia et autres de Juan Fernandez. The Natural History of Juan Fernandez and Easter Island 3: 377–380.

Pic M (1926) Phloeophilidae, Rhadalidae, Prionoceridae. In: Jung W (Ed) Coleopterorum Catalogus 87, Berlin.

Pileckis S, Monsevicius V (1995) Keršvabaliniai (Cleroidea). In: Lietuvos Fauna. Vabalai 1. Mokslo ir enciklopediju leidykla, Vilnius, 271–281.

Piller M, Mitterpacher L (1783) Iter per Posegnam Sclavoniae provinciam mensibus Junio, et Julio Anno MDCCXXXII suspectum. Budae, Typis regiae universitatis, 147 pp + 16pls.

Plata-Negrache P, Prendes-Ayala C (1981) Los Ostomidae (Col.) del Archipiélago Canario. Boletín de la Asociación Española de Entomología 4: 225–234.

Ponomarenko AG, Kireichuk AG (2004–2008) Taxonomic list of fossil beetles of the suborder Scarabaeina (part 2 of catalogue). http://www.zin.ru/Animalia/Coleoptera/eng/paleosy2.htm

Ponomarenko AG (1985) Yurskiye nasekomye Sibiri i Mongolii. [Coleoptera from the Jurassic of Siberia and Western Mongolia.] Trudy Paleontologicheskogo Instituta 211: 47–87.

Ponomarenko AG (1986) [Insects in the Early Cretaceous ecosystems of the West Mongolia. Descriptions of fossils Scarabaeida (= Coleoptera)]. Sovmestnaya Sov-Mongolskaya Paleontoleontologicheskaya Ekspediciya, 101 pp.

Ponomarenko AG (1990) Nadsemeystvo Cleroidea Latreille, 1802. In: Raznitsyn AP (Ed) Pozdnemezozoyskiye nasekomye Vostochnogo Zabaykaliya. Nauka Press, Moscow, 72–74.

Pospischil R (2003) The bread beetle *Tenebroides mauretanicus*. Der Schwarze Getreidenager *Tenebroides mauretanicus*. Praktische Schaedlingsbekaempfer 55(7–8): 4–5.

Purrini K, Ormieres R (1979) Über eine neue Neogregarine, *Farinocytis tenebrioides* n. sp. des Getreidenagers. *Tenebrioides mauretanicus* L. (Coleoptera, Ostomidae). Zoologischer Anzeiger 202(5–6): 437–443.

Ratti E (1997) Catalogo dei Coleotteri della Laguna di Venezia. VIII – Trogossitidae, Cleridae, Lymexylidae. Bollettino del Museo civico di Storia Naturale di Venezia 47: 177–185.

Reeve JD, Strom BI, Rieske LK, Ayres BD, Costa A (2009) Geographic variation in prey preference in bark beetle predators. Ecological Entomology 34(2): 183–192. doi: 10.1111/j.1365-2311.2008.01055.x

Reitter E (1875) Revision der Gattung Trogosita Oliv. (Temnochila Westw.). Verhandlungen des naturforschenden Vereines in Brünn 13: 3–44.

Reitter E (1875) Süd- und Mittel-Amerikanischen Arten der Gattung *Tenebrioides* Pill. et Mitterp. (Trogosita Strm., Er., Redt., Thoms., Horn). Verhandlungen des naturforschenden Vereines in Brünn 13: 65–79.

Reitter E (1876) Systematische Eintheilung der Trogositidae. (Familia Coleopterorum). Verhandlungen des naturforschenden Vereines in Brünn 14: 3–66.

Reitter E (1877) Beiträge zur Kenntniss aussereuropäischer Coleopteren. Mittheilungen des Münchener Entomologischen Vereins 1877: 126–140.

Reitter E (1880) Neun neue Clavicornien (Coleoptera). Verhandlungen des naturforschenden Vereines in Brünn 18: 1–6.

Reitter E (1890) Coleopterologische Notizen. XXXIX (November 1890). Wiener Entomologische Zeitung 9(30): 264–267.

Reitter E (1911) Fauna Germanica. Die Käfer des Deutschen Reiches. III. Band. KG Lutz Verlag, Stuttgart, 436 pp. + 48 tabs.

Reitter E (1922) Bestimmungs-Tabellen der europäischen Coleopteren. VI. Heft. Enthaltend die Familien Colydiidae, Rhysodidae, Trogositidae. Zweite, ganzlich umgearbeitete und auf die palaearktische Fauna ausgedehnte Auflage. E. Reitter, Troppau, 73 pp.

Ren D (1995) Fossil Insects. In: Ren D, Lu L-W, Guo J-G, Ji S-A (Eds) Fauna and Stratigraphy of Jurassic-Cretaceous in Beijing and the adjacent areas. Seizmic Publishing House, Beijing, 47–121.

Ross DW, Daterman GE (1998) Pheromone-baited traps for Dendroctonus pseudotsugae (Coleoptera: Scolytidae): influence of selected release rates and trap designs. Journal of Economic Entomology 91(2): 500–506.

Šablevičius B, Ferenca R (1995) 14 new and 3 rare for Lithuania species of Coleoptera found in 1987–1994. Institute of Ecology, Lithuanian Entomological Society, Vilnius 1995, 184pp.

Sakamoto JM (2007) Notes on the occurrence of *Nemosoma attenuatum* Van Dyke, 1915 (Coleoptera: Trogossitidae), in California with a literature review and museum survey of *Nemosoma* spp. Pan-Pacific Entomologist 83(4): 342–351. doi: 10.3956/2007-19.1

Sarikaya O, Avci M (2009) Predators of Scolytinae (Coleoptera: Curculionidae) species of the coniferous forests in the Western Mediterranean Region, Turkey. Turkiye Entomoloji Dergisi 33(4): 253–264.

Schaeffer CF A (1915) Change of generic names. Journal of the New York entomological Society 23: 68–69.

Schaeffer CF A (1918) On some genera and species of the family Ostomidae. Journal of the New York entomological Society 26: 190–201.

Schaeffer CF A (1920) Ostomidae. In: Leng CW (Ed) Catalogue of the Coleoptera of America, north of Mexico. Mont Vernon, N.Y., 193–194.

Schawaller W (1993) Taxonomie und Larvalmorphologie palaarktischer Leperina (Coleoptera: Trogossitidae). Stuttgarter Beiträge zur Naturkunde, Serie A (Biologie) 500: 1–9.

Schmied H, Wappler T, Kolibáč J (2009) A new bark-gnawing beetle (Coleoptera, Trogossitidae) from the middle Eocene of Europe, with a checklist of fossil Trogossitidae. Zootaxa 1993: 17–26.

Schmied H, Wappler T, Kolibáč J, Kubisz D (2009) New Zealand beetle in Baltic Amber – Biogeography and Systematics of a new fossil bark-gnawing beetle (Trogossitidae). Terra Nostra, Schriften der GeoUnion Alfred Wegener-Stiftung 3: 105–106.

Šefrová H, Laštůvka Z (2005) Catalogue of alien animal species in the Czech Republic. Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis 53: 151–170.

Sharp D (1877) Descriptions of some new species and indications of new genera of Coleoptera from New Zealand. Entomologists Monthly Magazine 13: 265–272.

Sharp D (1891) Fam. Nitidulidae, Trogositidae, Synteliidae. In: Godman FD, Salvin O (Eds) Biologia Centrali-Americana. Zoologia. Insecta. Coleoptera. Vol. II, Part 1. Dulau and Co., London, xii+717+1 pp, 19 pls.

Skatulla U, Feicht E (1992) Untersuchungen zum Anflugverhalten des Kupferstechers (*Pityogenes chalcographus* L.) und einiger Beifange an Pheromonfallen mit Hilfe eines neuartigen elektronischen Messgerates. Anzeiger fuer Schaedlingskunde Pflanzenschutz Umweltschutz 65(1): 4–7. doi: 10.1007/BF01905974

Ślipiński SA (1992) Larinotinae – A new subfamily of Trogossitidae (Coleoptera), with notes on the constitution of Trogossitidae and related families of Cleroidea. Revue suisse de Zoologie 99: 439–463.

Solier AJ J (1849) Orden III. Coleoptera. In: Gay C. Historia fisica y politica de Chile segun documentos adquiridos en esta republica durante doce anos de residencia en ella y publicada bajo los auspicios del supremo gobierno. Tomo quarto. Zoologia. Museo de Historia Natural de Santiago, Paris-Santiago, 105–511.

Spahr U (1981) Systematischer Katalog der Bernstein- und Kopal-Käfer (Coleoptera). Stuttgarter Beiträge für Naturkunde (Ser. B) 80: 1–107.

Spinola M (1844) Essai monographique sur les Clérites Coléoptéres. Tomes 1, 2. Impr. de fréres Ponthenier, Genes, 386 pp.

Stephens JF (1830) Illustrations of British entomology or, a synopsis of indigenous insects: containing their generic and specific distinctions with an account of their metamorphoses, times of appearance, localities, food, and economy, as far as practicable. Volume III, Mandibulata. Baldwin and Cradock, London. 447 pp + pls xvi–xix.

Stresemann E, Hannemann H, Klausnitzer B, Senglaub K (1989) Exkursionsfauna fur die Gebiete der DDR und der BRD. Band 2/1. Wirbellose: Insekten – Erster Teil. 8 Auflage Volk und Wissen Volkseigener Verlag, Berlin, 504 pp.

Struble GR, Carpelan LH (1941) External sex characters of two important native predators of the mountain pine beetle in sugar pine. Pan-Pacific Entomologist 17: 153–156.

Svitra G, Aliukonis A (2009) Data on five protected species of beetles (Coleoptera) recorded in Lithuania in 2007–2009. New and Rare for Lithuania Insect Species Records and Descriptions 21: 72–75.

Swezey SL, Dahlsen DL (1982) Effects of insecticides on selected natural enemies of the western pine beetle (*Dendroctonus brevicomis*). Entomological Society of America Pacific Branch Annual Meeting 65: 142.

Szafraniec S (1997) Beetles (Coleoptera) new to the Babia Gora Mountain. Wiadomosci Entomologiczne 15(4): 207–215.

Szwalko P, Kubisz D (1994) New records of *Tenebroides fuscus* (Goeze) (Coleoptera: Trogossitidae) in Poland. Acta Entomologica Silesiana 2(2): 46.

Tait SM, Dahlsten DL, Gill RJ, Doyen JT (1990) Life history of the Incense Cedar Scale, Xylococculus macrocarpae (Homoptera: Margarodidae), on Incense Cedar in California with a description of the larvae of one of its common predators, Eronyxa expansus Van Dyke (Coleoptera: Trogositidae). Hilgardia 58: 1–19.

Teson A, Dagoberto EL (1979) 'Asociacion' de insectos y acaros con Megachile gomphrenae y *M. pallefacta* (Hymenoptera) de la provincia de Buenos Aires. Revista de la Sociedad Entomologica Argentina 38(1–4): 127–131.

Theunert R (2006) A new record of *Thymalus limbatus* F., 1787 in Westphalia after over 125 years (Col., Peltidae). Mitteilungen der Arbeitsgemeinschaft Westfaelischer Entomologen 22(3): 113–114.

Thomson CG (1859) Skandinaviens Coleoptera, synoptiskt bearbetade. I. Tom, Tryckt uti Berlingska Boktryckeriet, Lund, 290 pp.

Thomson CG (1862) Skandinaviens Coleoptera, synoptiskt Bearbetade. Tom IV. Lundbergska Boktryckeriet, Lund, 269 pp.

Tsinkevich VA (1997) Review of family Trogossitidae (Coleoptera) the fauna of Belarus. Vestnik Belorusskogo Gosudarstvennogo Universiteta Seriya 2 Khimiya Biologiya Geografiya 1: 27–29, 76.

Uchida A (1980) Studies on the life cycle of cestode parasitic in the small intestine of Japanese quail. Bulletin of Azabu University Veterinary Medicine 1(1): 61–73.

Valcarcel JP, Prieto Pilona F (2001) New records of Coleoptera for Galicia (N.W. Iberian Peninsula). Boletin de la SEA 28: 109–110.

Van Dyke EC (1915) Some new beetles in the families Ostomidae (Trogositidae) and Cleridae from California. Bulletin of the Brooklyn entomological Society 10: 25–33.

Van Dyke EC (1916) Supplementary notes and descriptions of North American Ostomidae, Cleridae, and Cossonus (Col.) Bulletin of the Brooklyn entomological Society 11(4): 71–79.

Van Dyke EC (1920) New name for *Nemosoma* punctulata. Bulletin of the Brooklyn entomological Society 15: 85.

Van Dyke EC (1944) New species of North American Ostomidae (Coleoptera). Pan-Pacific Entomologist 20: 147–153.

Villemant C, Ramzi H (1997) Predators of *Lymantria dispar* (Lep. Lymantriidae) egg masses: spatio-temporal variation of their impact during the 1988–89 pest generation in the mamora cork oak forest (Morocco). Entomophaga 40 (3–4): 441–456. doi: 10.1007/BF02373731

Vogt H (1967) 48. Familie: Ostomidae. In: Die Käfer Mitteleuropas. Band 7. Goecke, Evers, Krefeld, 14–18.

Waltz RD (2002) Reports of rarely collected or previously unreported Indiana Coleoptera (Insecta): Cerambycidae, Cerophytidae, Hydraenidae, Hydrophilidae, Nitidulidae, Scarabaeidae, Staphylinidae, Trogossitidae. Proceedings of the Indiana Academy of Science 111(2): 177–181.

Weidner H (1993) Bestimmungstabellen der Vorratsschadlinge und des Hausungeziefers Mitteleuropas. 5., überarbeitete und erweiterte Auflage. [Identification tables of stored product and household pests of Central Europe. 5th revised edition]. Stuttgart, Jena, New York. i–xi, 1–328.

Westcott RL, Kelly S, Fullerton S (2007) A new prey record for *Temnochila virescens* (Fabricius): *Actenodes acornis* (Say) (Coleoptera: Trogositidae, Buprestidae). Coleopterists Bulletin 61(4): 573. doi: 10.1649/0010-065X(2007)61[573:ANPRFT]2.0.CO;2

Westwood JO (1830) On the affinities of the genus Clinidium of Kirby. Zoological Journal 5: 213–237.

Westwood JO (1864) Descriptions of new species of Coleoptera. Proceedings of the Entomological Society of London (1864): 11–12.

Whitehouse NJ (1997) Insect faunas associated with *Pinus sylvestris* L. from the Mid-Holocene of the Humberhead Levels, Yorkshire, U.K. Quaternary Proceedings 5: 293–303.

Wickham HF (1910) New fossil Coleoptera from Florissant, with notes on some already described. American Journal of Science 24: 47–51. doi: 10.2475/ajs.s4-29.169.47

Wickham HF (1913) Fossil Coleoptera from the Wilson ranch near Florissant, Colorado. Bulletin of the State University of Iowa 57: 3–29+7pl.

Wickham HF (1916) A new brachyelytrous trogositid beetle from Colorado. Psyche 23: 146–148. doi: 10.1155/1916/35697

Wielink P, Felix R, Spijkers H, Teunissen AP JA (2010) *Phloiophilus edwardsi*i in 'De Kaaistoep' near Tilburg (Coleoptera: Phloiophilidae). Entomologische Berichten 70: 17–20.

Wigger H (1993) Okologische Bewertung von Rauber-Beifangen in Borkenkäfer-Lockstoffallen. Anzeiger für Schaedlingskunde Pflanzenschutz Umweltschutz 66(4): 68–72. doi: 10.1007/BF01903073

Wigger H (1994) Die Reaktion der Frasskapazitat des Borkenkäferraubers *Nemosoma elongatum* L. (Col., Ostomidae) im Imaginalstadium auf unterschiedliches Beuteangebot in kunstlichen Gangen. Anzeiger für Schaedlingskunde Pflanzenschutz Umweltschutz 67(1): 8–13. doi: 10.1007/BF01906562

Wigger H (1996) Population-dynamics and predator-prey-interaction between the predator *Nemosoma elongatum* and the bark beetle species *Pityogenes chalcographus* (Coleoptera: Ostomidae, Scolytidae). Populationsdynamik und Rauber-Beute-Beziehung zwischen dem Borkenkäfer-Rauber *Nemosoma elongatum* und dem Kupferstecher *Pityogenes chalcographus* (Coleoptera: Ostomidae, Scolytidae). Entomologia Generalis 21(1–2): 55–67.

Williams KK, McMillin JD, DeGomez TE (2009) 11. Relative and seasonal abundance of three bark beetle predators (Coleoptera: Trogositidae, Cleridae) across an elevation gradient in ponderosa pine forests of north central Arizona. Western North American Naturalist 69(3): 351–363. doi: 10.3398/064.069.0309

Winkler A (1927) (1925–1932) Catalogus Coleopterorum Regionis Palaearcticae. Albert Winkler, Wien, 880 pp.

Wollaston TV (1862) On the Euphorbia-infesting Coleoptera of the Canary Islands. Transactions of the Entomological Society of London, 3rd series 1: 136–164.

Zhang J-F (1992) Fossil Coleoptera from Laiyang, Shandong Province, China. Acta entomologica sinica 35: 331–338.

Yoshitomi H, Lee C-F (in press) A revision of the genus *Kolibacia* Leschen and Lackner (Coleoptera, Trogossitidae, Trogossitinae). Entomological Science.

Yu Y, Leschen RA B, Ślipiński A, Ren D, Pang H (2012) The first fossil bark-gnawing beetle from the Middle Jurassic of Inner Mongolia, China (Coleoptera: Trogossitidae). Annales Zoologici (Warszawa) 62: 245–252. doi: 10.3161/000345412X652765

Zherichin VV (1978) Razvitie i smena melovych i kainozoiskich faunisticeskich kompleksov (tracheinye i chelicerovye). Trudy paleontologicheskogo instituta, Nauka, Moskva, 165: 200 pp.

Zhou J-L, Darrell R, Niwa W, Christine G (2001) Kairomonal response of *Thanasimus undatulus*, *Enoclerus sphegeus* (Coleoptera: Cleridae), and *Temnochila chlorodia* (Coleoptera: Trogositidae) to bark beetle semiochemicals in eastern Oregon. Environmental Entomology 30(6): 993–998. doi: 10.1603/0046-225X-30.6.993